Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

Vol. XVII | CHICAGO, SATURDAY, JANUARY 9, 1909 | No. 2

PUBLISHED EVERY SATURDAY BY THE

Telephony Publishing Company

Monadnock Block, Chicago

Telephone Harrison 2951

H. B. McMeal, President — F. S. Kenfield, 1st Vice-President
W. H. Graffis, 2d Vice-President — H. D. Fargo, Secretary-Treasurer

Edited by H. B. McMeal and Franklin H. Reed

The present publication comprises

Vol. 17	Telephony	No. 2
Vol. 17	Sound Waves	No. 2
Vol. 19	American Telephone Journal	No. 2
Vol. 33	Telephone Magazine	No. 2
Vol. 56	The Telephone	No. 2

TERMS OF SUBSCRIPTION:

United States, Cuba and Mexico.....per year, $3.00
Canada 4.00
Other Foreign Countries within the Postal Union..... 5.00

NOTICE TO ADVERTISERS

Changes of advertising copy should reach this office ten days in advance of date of issue. New advertisements accepted up to noon of Monday for the paper dated Saturday of the same week.

Copyright, 1909, by Telephony Publishing Company

Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1879.

CHICAGO, SATURDAY, JANUARY 9, 1909.

CONTENTS.

Editorial 29
The Majorana System of Wireless Telephony. By Aurio Carletti..... 31
International Association Secretary's Report..... 34
Wood Preservation with Particular Reference to Telephone Poles. (Concluded.) By W. F. Sherfesee..... 36
Economical Development of Toll Territory. By Frank F. Fowle 38
Letters on Practical Subjects..... 42
Wave Distortion in the Carbon Transmitter..... 42
Preventing Cable Troubles..... 42
Vent in Battery Cabinets..... 42
Telephone Law. By A. H. McMillan..... 43
Practical Questions and Answers..... 44
Telephone News.....45, 46, 47, 48, 49, 50
Consolidation of Large Nebraska Independent Companies.... 45
Vermont and New Hampshire Independents to Meet at St. Johnsbury 45
Nebraska to Have Big Convention..... 45
Combination of Large Independent Properties in Western New York 46
Indianapolis Telephone Company Wins Victory..... 47
Illinois Tunnel Company's Chicago Franchise Extended..... 48
Meeting of the Mississippi Independent Telephone Association 49
Southern Independent Telephone Association to Meet in February 49
Iowa Association's President Talks on Discriminatory Charges 50
Telephone Patents. By Max W. Zabel..... 51
In the Manufacturing Field.....52, 53
Condensed News Reports.....54, 55, 56

Wood Preservation.

The conservation of our national resources is a subject of importance to every American citizen. So recklessly have we been making use of these resources that the Federal government, co-operating with many of the States, is studying the problem of conserving them for our own future needs and the needs of generations to come. Telephone men have a double interest in this great problem, from the viewpoint of public spirited citizens having at heart the national welfare, and the selfish viewpoint of large consumers of timber.

The conservation of our timber supply is necessary not only to prevent excessive rise of prices in consequence of diminishing supply, but, looking farther ahead, to prevent a timber famine. The reckless waste of timber resources caused by increasing consumption and improper methods of forestry can but lead ultimately to a large degree of deforestation, which in turn will destroy the value of our abundant water powers and thus enhance the consumption of coal for power generation. The stability of our water powers depends upon the uniformity of stream flow and in turn upon the forests which cover the water sheds, whose function is to regulate the seepage of rain water from the mountains and hillsides into the streams. The deforestation of the watersheds would cause freshets and floods to succeed each rainfall, leaving the streams very low or entirely dry during droughts.

It has been urged that the conservation of our coal beds requires the development of all available water powers, and it must be apparent to all that the protection of the forest covered, mountain water sheds is imperative to such development. It appears, therefore, that we cannot waste one of our natural resources without increasing the burden upon the others. We are therefore greatly concerned with the conservation of our timber supply beyond the immediate necessity of economizing in its use and prolonging its life.

We wish to commend to all the telephone men as one of the most important matters now before them, the subject of wood preservation. The Federal government has attacked the entire problem of conservation from two directions; on one side, the protection of the forests and the introduction of proper methods of forestry, and, upon the other, the development of methods for preventing the decay of timber. The excellent paper on wood preservation, by Mr. W. F. Sherfesee, of the U. S. Forest Service, which is concluded in this number, should receive the careful consideration of every consumer of poles. The entire subject is clearly presented and we would call gen-

eral attention to the open tank method of treating pole butts which is described. This appears to be cheap and is authoritatively stated to be effective in prolonging the life of the poles materially. The attendant reduction of the annual rate of pole line depreciation is therefore the immediate gain within the reach of every company about to construct new lines or rebuild old ones.

Regulation and Progress in Nebraska.

Nebraska telephone companies are thoroughly appreciative of the attitude of the State Railway Commission in its efforts to fairly settle questions relating to the telephone business over which it has regulative jurisdiction. Its methods seem to be invariably to gather information at first hand, and to co-operate with the companies as effectively as with the public to enable both interests to obtain the best results from operation. Numerous minor difficulties have been equitably settled, while the Commission has been steadily preparing itself for the treatment of some of the larger questions in the handling of which it must make a record of success or failure which will undoubtedly attract the attention of the entire country.

The calling of a conference next week, at the time of the convention, gives to all telephone men in the state an exceptional opportunity to present statements of fact and opinion which will assist the Commission to obtain a clear understanding of some features of the complicated topics which it has set down in its program. This action is a long step in the right direction, and it is to be hoped that telephone men will take enough interest in these proceedings to bring out a large attendance and an active and well-considered discussion.

This year's convention in Nebraska offers exceptional prospects of usefulness, and it is not going too far to predict that its proceedings will have a decided influence on the prosperity of the telephone business in that state during the next twelve months. Nearly every telephone man active in the management of Independent property is likely to be in attendance, where, indeed, all owe it to themselves to be.

The Indianapolis Independent Victory.

Sentiment certainly does continue to play a prominent part in the conduct of the telephone business. When the Central Union company succeeded in procuring the public prosecutor to take up its quarrel with the competitor it has been so vigorously trying to put out of business in the city of Indianapolis, it paved the way for some unpleasant advertising. The public may not be interested in the question whether it is proper and honest for a company which is not paying dividends to its stockholders to enter into expensive litigation for the purpose of destroying a competitor. But when a public service corporation succeeds in dragging the name of the State into an action which a large number of citizens consider not only ungrounded, but disreputable, and uses the public prosecutor to pull its chestnuts out of the fire there is revealed a political situation which is certainly an appropriate subject for careful investigation, and this phase of recent litigation has not been overlooked by the public.

It is interesting to note that Judge Parr, in his decision, adds new matter to the already imposing array of authoritative judicial opinions upholding the necessity of competition for the protection of telephone users. He says:

"Under the said lease and the ordinance adopted by the city, * * * no competition was destroyed * * and, so far as this information discloses, there has been no failure on the part of said companies in the performance of their duties." This was advanced by Judge Parr to support his refusal to forfeit the charters of the companies, as petitioned. He further says:

"A number of cases were cited on the question of forfeiture. One of the cases was 153 Indiana, 483, known as the Portland Gas Case. In that case, two corporations entered into a lease, but in that case the two corporations were competitors. That lease was against public policy because it destroyed competition, therefore that case is not parallel with this case because the question of competition was involved." He also mentioned the dissimilarity between the present case and that of Eel River Railroad Co. vs. State, ex rel, 155 Indiana, 455, in which the important question was the validity of a lease between two competing railroads.

In view of these statements there can be only one inference as to the nature of Judge Parr's opinion of the validity of a lease between competing companies, should such a question ever come under his jurisdiction.

Profitable Exchange of Information.

Some few weeks ago we started what we hoped might grow into a new and valuable department of TELEPHONY. We headed it "Letters on Practical Subjects," and left it with our subscribers in the hope that they would make it a success. Now, almost everybody who writes to us seems to think this is one of the best features of the paper. In this we thoroughly agree with them, but, of course, we want to see the department get bigger and better as time goes on.

This means simply that a live man, who does things in a new way, has a chance to write a letter telling in his own words just what he has done, and why it is an improvement over the old method. If a photograph or diagram can be sent with the letter, to help the reader grasp the idea more quickly and thoroughly, so much the better. By sending this letter to us, he can put his idea before all the telephone men in the world, all reading it at practically the same time.

We find that a considerable number of managers and men in charge of different departments of telephone work are sending in descriptions of good ways of doing things which ought to be useful in other exchanges. Very often the publication of these letters brings a device to the attention of a man who can suggest improvements, and who does so in another letter, thus giving the writer of the first communication a direct return of practical value for the information he has given out.

Progress in the telephone business, when it is general, signifies that our many companies are keeping step in their advance. All should know of improvements as soon as one devises them. By giving telephone men a proper medium for the distribution of their ideas, we believe this new department can be made of great value to the industry.

The Majorana System of Wireless Telephony

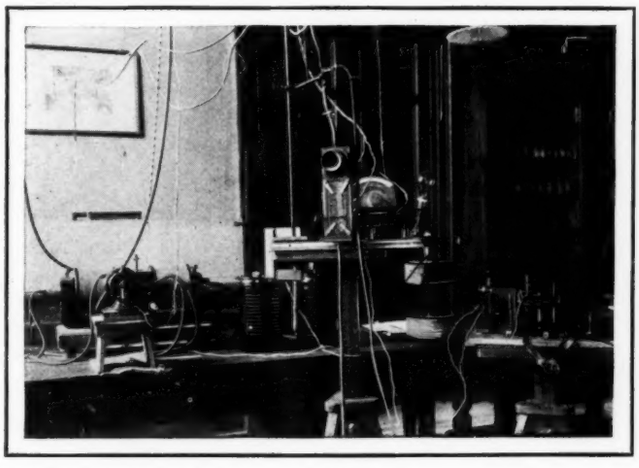
By Aurio Carletti

For some years past, Professor Quirino Majorana, director of l'Institut Supérieur Postale Télégraphique, at Rome, Italy, has been working upon the complex problem of telephoning without wires. As early as the year 1904 he obtained gratifying results in the laboratory of the Physical Institute of the University of Rome, with the faculty of which he was at that time connected. Afterward, while in charge of the administration of l'Institut Supérieur Postale Télégraphique, he has continued his interesting experiments in radio-telephony, and, recently has succeeded in achieving perfect telephone communication over a distance of about 500 kilometers.

Since his first experiments, Professor Majorana has held the belief that in order to solve the problem of telephoning without wires, it is indispensable to care for two fundamental conditions. That is to say, that it is necessary to have a means of generating undamped, continuous electrical oscillations; and second, that it is essential to have a very powerful transmitter, capable of supporting a large difference of potential while carrying very strong currents.

The physicists who have treated these questions, are, in general, in accord in realizing that for successful wireless telephony, it is necessary that the waves should be undamped. Consequently, Professor Majorana has sought, in the first place, to develop a generator capable of producing an extremely rapid succession of discharges, and subsequently, he has studied a method of modifying the intensity and other characteristics of the waves in such a manner as to produce fluctuations in the amount of energy sent forth from the antenna in perfect correspondence with the variations in sound produced before the transmitter.

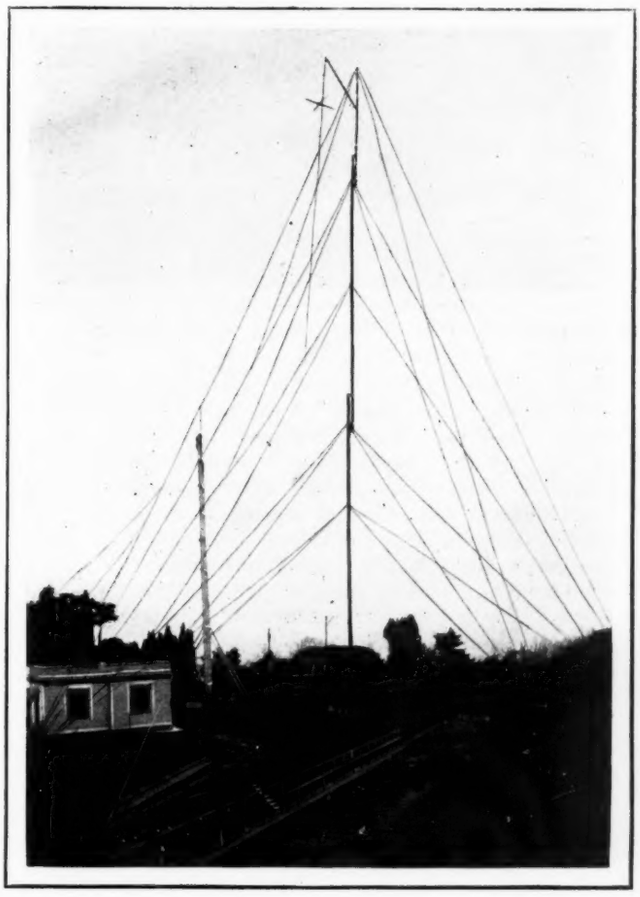
In his first experiments, Professor Majorana employed a rotating oscillator which consisted of a motor, upon the axis of which was fixed a disk of ebonite which carried upon its opposite faces two rings of metal. Upon these rings there rested two brushes of metal, connected in the discharge circuit. Two steel wires, 2 mm. in diameter, and about 70 cm. long, were attached to the metallic rings, and ran parallel, between them. Their extremities, forming a spark gap, were placed close together.



Complete Wireless Telephone Station (Majorana System), as Installed at l'Institut Superieur Postal Telegraphique, Rome.

The two wires of the oscillator were connected to the secondary of a static transformer, of which the primary winding was traversed by alternating current from the electric light mains.

While the motor was rotating, the two wires of the oscillator turned with it. The sparks which passed across the gap between the two wires were then subjected to violent air pressure, and, consequently, each one was separated and broken up into a considerable number of minor discharges. With this device Professor Majorana succeeded in producing an interrupted series of sparks at the rate of about 20,000 per second.



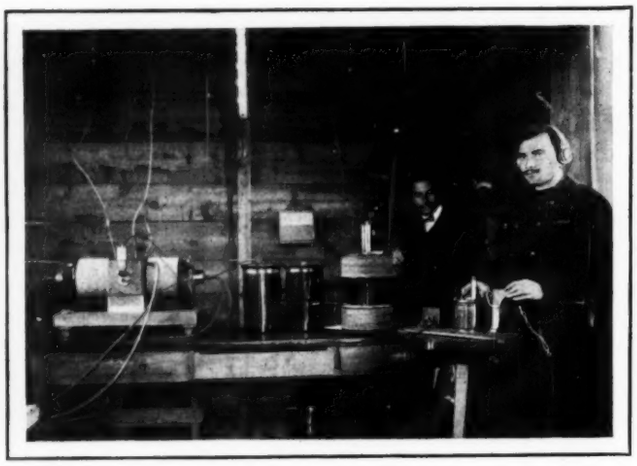
Antenna for Wireless Transmission at Monte-Mario (Rome). Wocden House, Near Antenna, Contains Wireless Telephone Apparatus.

For the modulation of these discharges in correspondence with spoken words, Professor Majorana built, during the year 1905, a hydraulic transmitter, an instrument capable of giving, in wireless telephony as well as in ordinary telephony, results which are quite remarkable. It is known that one of the greatest difficulties encountered in wireless telephony is that the ordinary granular carbon transmitter is not suited to the rigid requirements of this work, on account of its insufficient electrical resistance, and its inability to support the high voltages and large current strengths generally employed for creating electromagnetic waves. Hence arose the necessity for developing a new transmitter which should be very powerful, and capable of supporting considerable differences of potential, and which should not heat up too much on being traversed by currents of several amperes.

This problem is believed to have been completely solved by Professor Majorana with his hydraulic transmitter, based upon the capilliary properties of liquid jets. This transmitter consists essentially of a small tube of glass, from the opening in which spurts a jet of slightly acidulated water under a carefully

regulated pressure. The small tube is fixed to the diaphragm of the transmitter, of which it can follow the vibrations. The liquid jet falls a certain distance away between two platinum electrodes, and establishes a liquid connection between them.

At this point one finds the characteristic resistance of the



Interior of the Telephone House at Monte-Mario.

transmitter, which, by its variations, determines the transmission of sounds and of words. When one speaks before the transmitter diaphragm, in the same way as with an ordinary transmitter, the diaphragm vibrates. The little tube, in following the diaphragm, causes contractions in the liquid jet, which, in turn, produce variations in the resistance of the liquid interposed between the two electrodes of platinum. There are thus produced fluctuations of resistance between the electrodes which are in perfect accordance with the sounds which cause them.

This ingenuous transmitter has been tried out upon wire lines, and has given very satisfactory results, making it possible to talk over a distance equal to that from the l'Institut Supérieur Postale Télégraphique, at Rome, to London, a distance of about 2,000 miles. Its use in ordinary telephony, however, has not been adopted on a practical scale, because it necessitates an equipment a little cumbrous and not particularly adapted for subscribers' stations.

On connecting the hydraulic transmitter to the circuit of the rotating oscillator, Professor Majorana succeeded in causing a variation in the intensity of the discharges in correspondence with the sounds set up before the transmitter. With this arrangement, he has been able to reproduce the voice at a considerable distance, and to receive speech with perfect comprehension by the use of an ordinary wireless telegraph receiver. These were the first gratifying results obtained by Professor Majorana during the years 1905 and 1906.

Later, the discovery of the Danish Valdemar Poulsen, which enabled him to produce undamped electromagnetic waves absolutely in an uninterrupted train, opened a new field for wireless telephone experiments, and Professor Majorana abandoned his rotating oscillator, and adopted apparatus analogous to that developed by Poulsen.

The Poulsen apparatus consists essentially of a voltaic arc burning in an atmosphere of hydrogen.

Before Poulsen, several other electricians had studied means of producing continuous waves. It had seemed that the investigations of Thompson, and of Duddell, on the singing arc, would lead to a method of generating continuous waves. But the intensity of the waves thus obtained was insufficient for the purpose of wireless telephony. Poulsen succeeded in considerably increasing both the intensity and the frequency of waves produced in a circuit resembling that employed by Duddell, thus transforming laboratory experiments into a system capable of working on a practical scale.

The device adopted by Poulsen consists in placing the voltaic arc in an atmosphere of hydrogen. In this particular case the arc produces alternating currents of a considerable intensity, and of which the frequency may vary from 200,000 up to about 1,000,000 vibrations per second.

The transverse magnetic field created by two electromagnets fed by the same current as the arc, serves to maintain the position of the arc with reference to the electrodes, and, consequently, to render more efficient, and more constant, the production of the waves.

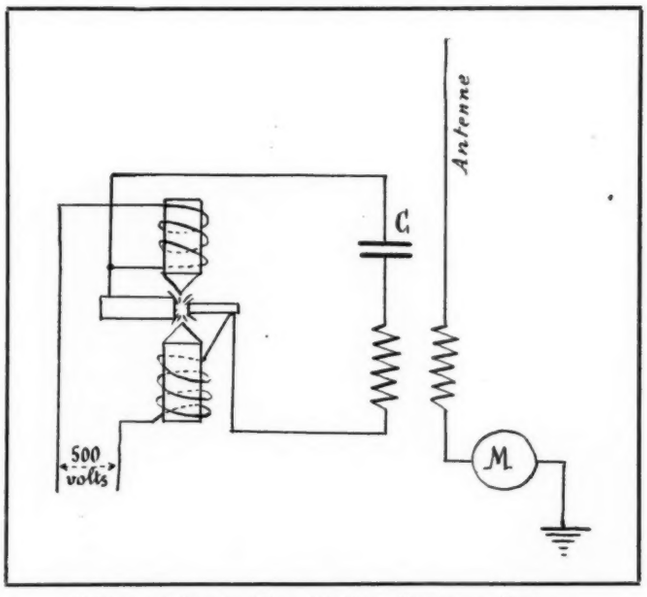
This generator of uninterrupted waves, with important modifications, has been suitably applied by Professor Majorana to his system of wireless telephony.

One of the accompanying illustrations represent the arrangement adopted at the transmitting station; the arc enclosed in an atmosphere established between two electrodes, one of carbon, the other of copper. The oscillatory circuit contains a capacity *C*, and the primary winding of a Tesla transformer. One terminal of the secondary of this transformer is connected with the antenna, which radiates into space the electric waves which are generated. The other terminal of the secondary is grounded through the hydraulic transmitter *M*.

Professor Majorana has also introduced certain variations in receiving apparatus, because the magnetic and electrolytic detectors which he first employed were found to be little adapted to the reception of waves set up by the Poulsen method.

The arrangement adopted for the receiving station comprises a separate oscillatory circuit, a second antenna and a thermo-electric detector *T*, composed of two metals in contact, which under the influence of the waves which strike them, are warmed to a greater or less degree, thus producing modifications of currents in correspondence with the electric waves received, and hence with the voice of the person speaking at the transmitter station. These variations of current are reproduced in the telephone receiver *R*.

A special syntonization system, very simple in design, of which the details have not yet been made public, is announced to assure secrecy of communication, and that perfect atune-



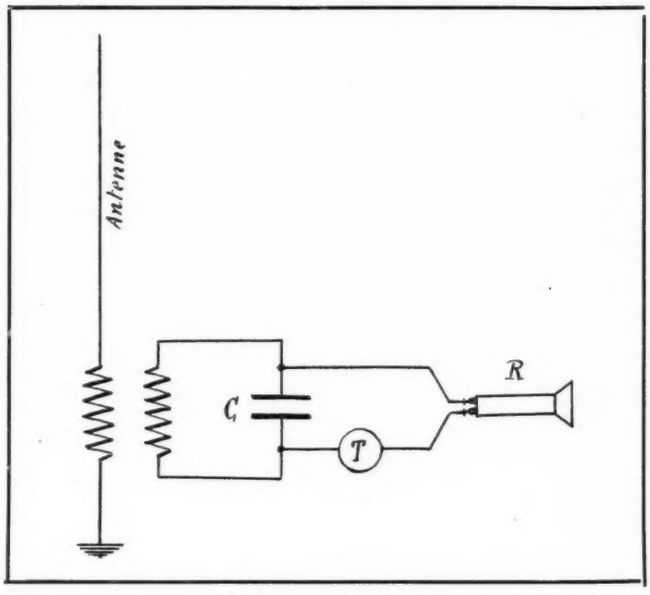
Wiring of Transmiting Station, Majorana System.

ment of receiving and transmitting equipments which is necessary for extremely distinct communications.

A slight variation of the self-inductance, or the capacity of the oscillatory circuit, at the receiving station, suffices to render the receiver insensible to the waves which reach it.

With this new system, Professor Majorana has been able to carry on some very interesting experiments between the wire-

less station at Monte Mario, at Rome, and the station at Anzio, 60 km. distant; as well as with the one at Ponza, 120 km. away. Other experiments have been made between Monte Mario and the torpedo boat "Lanciere," while it was 200 km. away on the Mediterranean; and between Monte Mario and



Wiring of Receiving Station.

the wireless telegraph station at Magdalena, near the island of Sardinia, 300 km distant.

In all these experiments, the telephonic communication is said to have been perfect, the voice arriving strong and clear so that it was possible to recognize the tones of the person who was speaking, even at a slight distance from the telephone receiver.

Other experiments have been made recently between Monte Mario and Trapani, in Sicily, and also between Monte Mario and Messina, in Sicily, about 500 km. away, with results quite satisfactory. Assurance is given that within a short time three wireless telephone stations of the Majorana system will be installed, one at Naples, another at Cagliari, in Sardinia, and a third at Palermo, Sicily.

Telephones and Electrical Apparatus on a Maine Farm.

In the *Maine Farmer*, published at Augusta, Maine, there appeared on Nov. 26 an interesting article showing the manifold uses of electric apparatus made on the "Electric Farm," owned by Messrs. A. O. and E. E. Ramsdell, of Auburn, Maine.

Electric equipment for many purposes has been introduced by E. E. Ramsdell, and his brothers A. B. and H. C. Ramsdell, all experienced electricians, who have shown much ingenuity in connecting up equipment to facilitate the work of the farm, and in lightening the household duties. Each room in the house is equipped with a telephone, from which communication may be had with the stable, poultry house and other buildings.

Good Pointers for a Directory.

The Johnson County Telephone Company, Iowa City, Iowa, appreciates the value of advertising space in directories, and uses a good deal of it for calling attention to features of its own business. In the December directory, the company states that it is receiving applications for new telephones at the rate of about twenty per month, without solicitation.

Attention is called to the company's facilities for connection to a large number of long distance points over copper toll lines. Over a page is devoted to matter calling attention to the great advantages which have come to the community in the way of more extended and high grade service, as well as reduced rates, resulting from the building of the Johnson County Telephone Company's plant, and its competition with the company previously in the field.

Particularly interesting paragraphs taken from the company's matter in the first pages of the directory are the following:

"Our idea is that an individual or an organization is entitled to receive, and usually gets, appreciation and support in proportion to the real value of the service rendered to the people of the age in which he or it is permited to exist. We aim to provide profit for our patrons, wages for our workers, and interest for our investors, thereby making it mutually profitable for all concerned. Profits for our patrons by making our service worth more in proportion to its cost through a period of years than they otherwise would have been compelled to pay had not the Johnson County Telephone Company come into the field. Profit for our workers by paying them more than would otherwise be received from the use of their time and efforts. Profit for our investors by the earning for them the current rate of interest.

"Our Plan is Attention. Attention to the needs and preferences of our patrons. Attention to the work as well as to the wages of our workers. Attention to the future of the property as well as to the present profit of our investors."

Other matter, tending to promote co-operation between the subscribers and the company is the explanation of the desirability of calling by number, and an invitation to patrons to visit the exchange and see how business is handled. Long distance business is prominently advertised in black letter sentences at the foot of pages carrying subscribers' lists.

The size of the directory shows that the company is now operating a very well developed system, and the classified list makes it clear that practically all the business concerns in this territory use the Independent telephones. There is also a long list of rural line subscribers, including those on lines of several small connecting companies which are named.

Telephone Courtesy in London.

Metropolitan newspapers printed last week contain a dispatch in which appears the following:

"London postoffice authorities have just issued instructions to their telephonists, impressing on them the need for observing outward forms of courtesy in their communications with telephone users."

The current number of the official postoffice circular contains a long notice of standard expressions to be used by telephonists engaged on trunk work. In the preamble it sets forth:

"In order that abrupt, uncouth expressions may be avoided in the telephone service telephonists engaged in trunk exchanges are in future to make use of the following expressions in connection with their work, and supervising officers should impress upon the staff generally the necessity of adhering to the authorized forms."

Entering into the details, the official preceptor of polite manners lays stress upon the advisability of using the word "please" where it can conveniently be introduced.

"A telephonist answering a call should announce her presence by saying, 'Trunk number, please.' Failing to hear what the subscriber says, she should say, 'What is your number, please?' and so when the subscriber's attention has been obtained for the trunk call the telephonist should say, 'What is your number, please?' If the subscriber should be kept waiting for more than the regulation time the telephonist should add, 'Sorry to have kept you waiting.'"

International Association Secretary's Report*

The first national organization among Independent telephone operating companies, and of which this Association is the successor, was formed at Detroit, in June, 1897. This therefore is the twelfth annual convention, the last being held in January, ten months ago.

STATE ASSOCIATION MEETINGS.

During the year nine of the State association conventions were attended by the International Association's president and secretary. The new Mississippi association, formed through the visit of the secretary to that State, has the elements of strength and loyalty which give primise of splendid future success. Without doubt the Mississippi association is destined to greatly strengthen our cause, and at the same time, through its organized competition, force the Cumberland Telephone Company to abandon its policy of furnishing inexcusably inferior service, and at unnecessarily high rates, particularly in view of the limited telephone development in its territory.

Without undertaking to list the many admirable features noted at each of the State meetings, it is desired to make the general statement that said meetings were not only enthusiastic but beneficial and convincingly emphasizes the fact that the Independent movement, thus far successful, will continue to progress and prosper. An exceptional feature at the West Virginia convention was the statement in the invitations sent out, that the manufacturers and supply houses were invited to make exhibits at the convention, and that such would be appreciated, but they could not contribute to the expenses of the association's meeting. This, in the writer's judgment, is the logical position for each State association to take.

In concluding this subject, it should be stated that the officers of the International Association found it more difficult and expensive to attend State association conventions than would have been the case if in arranging the dates for such, it had been planned somewhat to the end of bringing said conventions near together, in adjacent territory. Therefore, while it may slightly change the historic date of meeting of certain State associations, it is recommended where practicable, that the State meetings be grouped on consecutive dates, resulting in economy in time and money, not alone to the International officers, to exhibitors and to journal representatives, but also because it would probably lead to greater interchange of visitations between the State associations.

EXECUTIVE COMMITTEE.

The members of the Executive Committee have been ever ready to respond to and assist the Association's officers during the year, and have kept in close touch with Association affairs, having given much time thereto.

LEGAL PROTECTION.

One result of conferences which have been held during the past year, because of the suggestions of Mr. H. D. Critchfield and others, was the conclusion that there is legal protection to be obtained against a Bell conspiracy and efforts, as manifested in the violations which the Bell companies were encouraging Independent companies to make of their exclusive long distance contracts with other Independent companies, and in the mergers, sales, purchases and connections, which said Bell companies were concertedly attempting, and in a number of instances had actually made in various parts of the country. The Bell companies, presumably as planned and instructed by the American Telephone and Telegraph Company, Boston—the parent Bell company—had apparently entered upon a deliberate plan and conspiracy, in violation of Federal and State laws, to break up and destroy the Independent telephone system, and thus eventually to re-establish its former monoply.

In order to prevent this result, those present at the May meeting decided that legal steps should be taken to prevent the Bell continuing its unlawful policy, which was to the detriment not alone of the Independent telephone companies and their stockholders, but to the people at large, as resulting, if the Bell were successful, in the stopping of telephone development, the increasing of telephone rates beyond what was fair and reasonable, and in the gradual and continued deterioration of exchange and toll service—in other words, in removing the benefits of competition in the telephone business.

To this end, therefore, those at the said telephone conference determined to raise a fund of not less than $40,000, and as much more as necessary, to protect the interests of the Independent telephone companies in general, and to prosecute, or cause to be brought proper suits against various Bell companies, which were openly and without reserve violating proper laws. Said persons at once signed $25,000 upon said fund, conditioned upon securing the minimum of $40,000 named, and appointed a Litigation Fund Committee of seven members.

As a result of having secured sufficient additional subscription to make the fund binding upon those signing, steps were taken to thoroughly investigate as to our rights under Federal laws, especially the Sherman anti-trust act, and under State anti-trust laws.

Many weeks were devoted to these matters, and to determining where to bring first suits, employing counsel, and securing witnesses and testimony where necessary. By this action, the International Association and the Conference Committee and Litigation Fund Committee, being closely allied, could carry forward plans in accord with the International Association's interests.

As the further result of those things that have been recited, the following has been done:

(1) In Iowa, at Dubuque, on November 10, injunction proceedings were brought by O. C. Snider, Kansas City, as a non-resident stockholder in said company, to restrain the Iowa (Bell) Telephone Company from voting the $40,000 of stock purchased by it, of the $70,000 outstanding stock of the Dubuque Telephone Company; or from exercising its control over said company, and to restore to the minority stockholders the former management of said company. The citizens of Dubuque are in sympathy with the Independent interests, and with the suit thus brought to protect the minority stockholders. It is believed that their cause is just, that the Bell interests will be ousted at Dubuque, and that the minority stockholders will ultimately secure justice through this action. Healy & Healy, Fort Dodge, Iowa, are the local attorneys in this case.

(2) On November 21, at Toledo, Ohio, before Judge Tayler, of the United States Circuit Court, suit was started by the United States Telephone Company, of Ohio, against the Central Union Telephone Company (Bell), the American Telephone and Telegraph Company (Bell), of Boston, and their officers and employees, to restrain said companies and individuals from carrying out the alleged conspiracy to cause local Independent companies, with which the U. S. company has long term exclusive toll contracts, to violate said contracts and connect with or sell out to said Bell interests; and other things.

Mr. D. J. Cable, Lima, Ohio, and Mr. Clarence Brown,

*Abstract of the report for 1908, of Secretary Jos. B. Ware, read at the convention of the International Independent Telephone Association, Chicago, December 2, 1908.

Toledo, Ohio, are the attorneys in said suit. This is a broader suit, and in certain respects more important to the general interests than is the Dubuque case.

An injunction was at once granted restraining said Bell companies from further negotiations with, or the conspiring with such contracting Independent companies, and ordering that the Bell toll line connections be immediately severed with the Richmond and Butler, Ind., companies, and with fourteen other companies in Ohio.

(3) On November 19, at Madison, Wis., a petition was presented to the attorney general of Wisconsin, Hon. F. L. Gilbert, reciting the facts of the formation in July, 1907, of the Beloit Home Telephone Company, which at once took over the Beloit Telephone Company (Independent) property at an agreed value, and the Beloit exchange of the Wisconsin Telephone Company (Bell) at an agreed price, both being paid for by stock in the new company, and thus giving the Wisconsin Bell a controlling interest. The local exchange rates were promptly increased; the service rapidly deteriorated, and today there are less telephones in service in Beloit than before the union of interests took place. The facts of this consolidation were admitted by Mr. Burt, president of the Wisconsin Bell, in a letter sent to the railroad commission of the State, March 9, 1908, and the main question involved seems to be whether the attorney general of the State "shall" bring suit to withdraw their charters, as it is believed and contended by us that the law clearly indicates and specifies. Hon. L. M. Sturdevant, Madison, Wis., has been retained as local attorney for the Independent interests.

Manifestly from necessity certain facts and information relating to other actions are here omitted, some of which perhaps are even of more importance to our cause than those herein mentioned. It may also be said that there are known to have been somewhat similar important violations of law in several states, and it is proposed to institute other suits in connection with such violations.

That the suits already started will be carried to the finish, if contested by the Bell, there is no question. We propose to prevent, if possible, violations of those laws, where such violations directly injure the Independent telephone interests, and the telephone rights and interests of the people of the several states.

It is hoped that the example set by the companies who have already joined in pledging to the litigation fund will lead other Independent companies, according to their interests, to likewise support these efforts to forward this policy of protection.

Ohio, as usual, has not only maintained its record of activity and accomplishment during the year, in telephone matters, but the Delphos decision, July 28, and the Middlepoint decision, October 12, each with an injunction against the Central Union (Bell) is of great advantage to our cause, and are legal precedents of great promise. They probably forecast the final decisions which will legally establish that the Bell and Independent systems are legal competitors, and that where an Independent company connects with or sells to a Bell company, both companies have committed a violation of law, as we contend and believe. (Copies of these decisions, and of the complaints in the Dubuque and Ohio cases, can be obtained at the offices of this Association.)

SAVANNAH, GEORGIA.

In April the secretary of the Association made a personal investigation as to conditions surrounding the absorption of the property of the local Independent company in Savannah, Ga., in February last, by the Southern Bell Telephone Company, of which the American Telephone and Telegraph Company (Bell) of Boston, owns all but 4/10 of one per cent of the stock. In their pamphlet numerously distributed, the Bell interests failed to state that before the petitions so extensively signed by citizens of Savannah were circulated, an agreement had been entered into, as shown by a copy officially filed with the railroad commission of the State of Georgia, by and between the Southern Bell Telephone Company and the local Independent company, by which the latter should circulate petitions to be prepared by the Bell company, and should secure a reasonable number of signatures thereto, which petitions should ask not only for the elimination of one company's service, but for a new franchise to the Southern Bell Company in Savannah and at specified rates. It was agreed also that the local company should obtain the consent of the mayor, city council and the State Railroad Commission to the sale of the local property to the Bell, although in the contract it was clearly suggested that such acts sought to be done were in themselves illegal—as they certainly were. The anti-trust law of Georgia is very broad and very severe. However, the acts conditioned by the contract were all performed and apparently without delay or difficulty, being aided with the Bell's political influence in the South; and thus competition was eliminated finally on July 1, last. Recently, for weeks past in fact, the public and the press have been denouncing the resulting poor service, and investigation has been threatened by the mayor and council.

The population of Savannah is 70,000. The new franchise rates granted February 8, 1908, to the Bell company, are as follows:

SAVANNAH, GEORGIA.

Subscribers Stations	Business Rates Unlimited		100 Calls Monthly	Residence Rates, Unlimited		67 Calls Monthly
	Single Line	Two on Line	Spec. Line	One	Two	Party Line
Up to 8,000	$60.00	$48.00	$48.00+3c	$36.00	$30.00	$24.00+3c
8,000-10,000	66.00	54.00	54.00+3c	42.00	36.00	30.00+3c
10,000-12,000	72.00	60.00	60.00+3c	48.00	42.00	36.00+3c
12,000-13,000	75.00	63.00	63.00+3c	48.00	42.00	36.00+3c
13,000-14,000	78.00	66.00	66.00+3c	48.00	42.00	36.00+3c
14,000-15,000	81.00	69.00	69.00+3c	48.00	42.00	36.00+3c

NOTE.—The 3c per call is for each call in excess of number named per month, and "In excess of 15,000 this agreement is not operative as to rates."

There were, one year ago, and are now, less than 4,000 Bell telephones in Savannah, and for business places the regular net rate was $40, by reason of competition. It will be observed that the new franchise increases the rates formerly charged, to *the regular established rates in the South.* About 16 per cent of duplication between the two systems existed during competition. (In 1899 the Bell had 1,050 telephones in Savannah; in 1900, 1,601, and the Independent company 1,250; 1907, Bell 3,500, Home 2,300.) It will, perhaps, interest those who have the subject of service rates under consideration to know what are the regular Bell rates in the South.

The Southern Bell company charges for exchange service as follows:

	Population	Business	Residence
Augusta, Ga.	44,000	$60.00	$36.00
Macon, Ga.	33,000	60.00	36.00
Columbus, Ga.	18,000	48.00	30.00*
Athens, Ga.	12,000	48.00	36.00
Brunswick, Ga.	9,500	48.00	24.00
Rome, Ga.	8,000	48.00	24.00
Barnesville, Ga.	3,500	36.00	24.00

*NOTE.—There is competition here!

These are the official Bell rates in Georgia, as filed with

the State Railroad Commission, at Atlanta. A comparison with rates elsewhere will prove of interest, and perhaps of profit.

RATES AND MERGERS.

It has been the intention and desire of the writer to present to this convention a sufficiently complete statement as to rates in various sections of the country to correct many false statements and impressions given out or created by Bell companies, upon the subject of rates, and prove beyond question or cavil, (1) that where there is no competition, Bell rates are unreasonably high, as a rule, and (2) in every single case higher than in any Independent exchange under like or very similar conditions; (3) that no Independent company anywhere has as high rates as the Bell company before competition, in the same place, with a quarter or less number of telephones; (4) and that with all Bell advertising of increase of the Independent rates there not one known instance where any Bell company has claimed the Independent rates are now too high, nor that the new rates asked for, (if any), are too high. They lead people to so infer, but do not state, for in no case has an Independent rate been asked for as high as the Bell before competition, as stated, under similar conditions. There is no instance today of an Independent rate that is too high for a fair profit, *or where any Bell company even claims same to be too* high. The writer regrets time and space prevent presenting data proving these statements, which, however, cannot be successful challenged. Thus the Bell, by misleading and paid publicity, seeks to destroy its competitors, and at the same time keep the public from examining into Bell rates, Bell service and Bell methods.

Any one desiring to investigate truly high rates and correspondingly poor service, is urged to look into conditions in the Southern States under the Southern Bell and Cumberland Bell companies; and for truly high rates and the best service the Bell companies can give with their apparatus, to investigate the New England States. Where there has been no competition to Bell exchanges are found high rates and poor service as a rule.

(*To be continued.*)

Wood Preservation, With Particular Reference to Telephone Poles*

By W. F. Sherfesee

Chief Office of Wood Preservation, U. S. Forest Service.

For the treatment of telephone poles, the non-pressure method possesses several decided advantages. First, it is distinctly simple, so simple, in fact, that the only absolutely necessary apparatus is an open-iron tank about 8 ft. deep, fitted with steam coils arranged along the bottom or sides; together, of course, with a tank for storing the preservative and a boiler for generating steam. Unless the most rigid economy is essential, the treatments can be hastened and cheapened by adding an underground receiving tank for holding the hot oil at the completion of the first bath, a pump to convey the liquid from the receiving to the storage tank, and a derrick for convenient loading and unloading. The second great advantage possessed by this type of plant for the treatment of telephone poles, is that it is possible to treat only the portion of the pole exposed to rapid decay. It is at the ground line that decay is most rapid. Here is generally found an abundant supply of all the essentials for the growth of wood-destroying fungi. Further up, there is too little moisture to permit of rapid fungus growth. But at the ground line all of these factors are present, and decay quickly destroys the unprotected pole. By the pressure cylinder method it is necessary to treat the entire pole, instead of merely five or six feet at the butt; and to inject just as much preservative into the naturally durable top as into the danger zone near the ground line. By the open-tank method it is possible to treat merely the butt of the pole,—say to about one foot above the ground line. The top can be painted for city service, or left in its natural state. The saving in the preservative, brought about by the treatment of six or seven feet instead of 30, is readily apparent.

Along the South Atlantic and Gulf Coasts, or in other regions of great warmth and humidity, it is often necessary to treat the entire pole. The top, while lasting longer than the untreated butt, still has not naturally a life sufficient to equal that of a butt properly treated. This is especially true when quick-decaying kinds of wood are used, as, for example, the second-growth old field pine of the South. In such situations, where the entire pole must be treated, the same process before described can be used to excellent advantage. Merely the design of the treating plant needs to be changed. For such work the closed horizontal cylindrical treating tank is best adapted—in appearance very similar to those in use at pressure plants. But as no steam bath or artificial vacuum is necessary, and as no pressure other than that of the atmosphere is used, much of the machinery needed by pressure plants can be omitted and the heating cylinders may be made of much lighter steel. All this means a most decided saving in cost. Prices vary, of course, in different parts of the country, but on a general average a plant for the entire treatment of 180 seasoned 25-foot pine poles per day of 10 hours can be completely installed for between $10,000 and $12,000. If a smaller capacity is desired, the cost of the plant can, of course, be reduced. For $5,000 a non-pressure, cylindrical treating plant can be installed which will have an estimated capacity of 50 30-foot seasoned pine poles per day. In the East, the butt treatment of a 30-foot chestnut or cedar pole will cost about 75 cents. Its life may be conservatively reckoned as more than 20 years. Twenty-five years would probably be a more accurate, but still conservative, estimate.

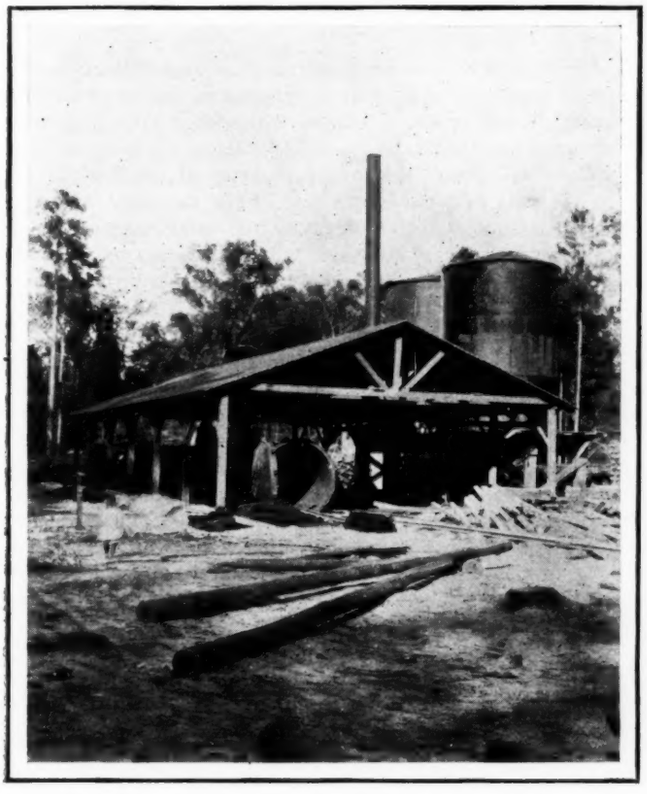
Such figures speak for themselves. Assuming that a chestnut pole set in the line costs $7 with an average life, untreated, of 10 years, the annual charge is $0.906; in other words, every such pole set in the line costs $0.906 per year, which with 40 poles to the mile corresponds to a capital of $724.00 invested at 5 per cent interest. Again, assuming that the butt of such a pole can be treated for 75 cents, the first cost of the pole set in the ground is $7.75. Taking the more conservative estimate of 20 years, the annual charge, then, of the treated pole is $0.621—a saving of $0.285—as compared with the same pole untreated. It is

*Abstract of paper presented at the convention of the International Independent Telephone Association, December 2, 1908. Concluded from issue of January 2, 1909.

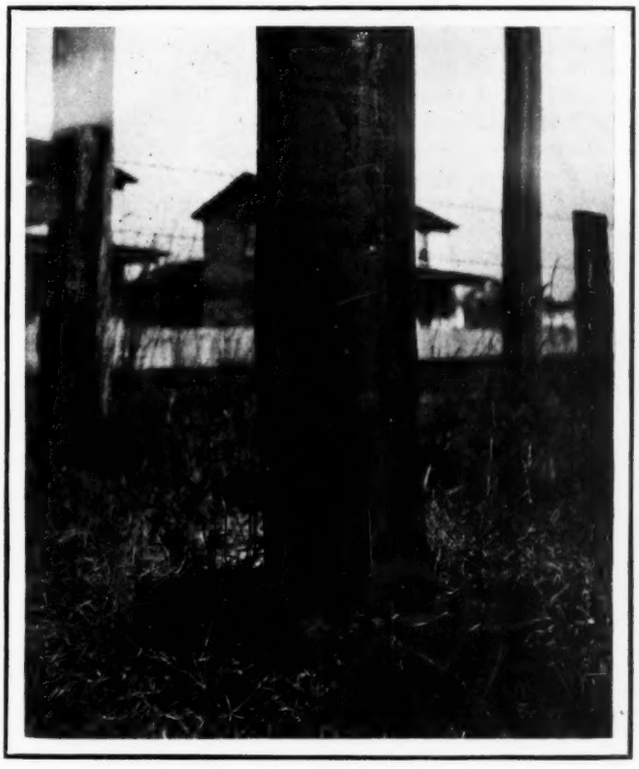
necessary to set aside for depreciation an amount equivalent to the returns on an investment of $724.80 for every mile of line if the poles are untreated; but the equivalent investment is only $496.80 if a proper treatment is applied.

Or—to take another example: A 30-foot Idaho cedar pole is worth about $5.25 in Colorado. A native, sound, fire-killed pine or spruce pole can be obtained at the same point for about $3.00. Allowing for the high cost of labor, for freight on the creosote and other supplies, let us assume that the butt-treatment of the poles costs $1.50 a piece. The first cost, therefore, of the treated native pole is $4.50, as compared with $5.25 of the untreated cedar pole. Assuming $7 to be the average cost of hauling and setting a pole in the mountain lines, 12 years the life of the untreated cedar pole and 20 years the life of the treated pine pole, we have an annual charge of $1.366 for the former and only $0.922 for the latter. Thus there is not only a saving in first cost, but also an additional annual saving of more than 44 cents for every pole in the line.

A less efficient but cheaper treatment can be secured by painting the surface of the timber with at least two coats of hot creosote, or some similar preservative. If care is taken thoroughly to fill the innumerable small checks and other defects on the surfaces of the wood, a thin antiseptic zone may be created around the ground line of the pole, which, as long as it remains intact, will successfully prevent the entrance of wood-destroying fungi. It is especially important in this method that the timber should be thoroughly air-dry before treatment. Otherwise, the evaporation of water from the interior of the stick will cause checks to open up, and so expose the unprotected wood to fungus attack. Even if this precaution is taken, however, a slight abrasion, such as might easily occur in the hauling or setting, or even after the pole has been placed in permanent position, will permit the entrance of the fungi and the destruction of the pole. Principally for these reasons this process cannot be recommended where a more thorough penetration is possible. It can often be used to good advantage, however, where the amount of timber to be treated is too small to justify the erection of even a small treating plant; or where the land is so rugged, as in mountainous districts, that the cost of hauling the poles even short distances to the treating plant is prohibitive.



A Non-Pressure Plant for Treating Telephone Poles and Crossarms.



Creosoted Pine Pole Near Norfolk, Va., Showing No Decay After Eighteen Years' Service.

In this discussion I have laid particular stress upon the open-tank or non-pressure process, to the practical exclusion of the pressure methods; but only because poles and similar timbers are particularly well fitted for impregnation without artificial pressure. This is due to the fact that a zone of porous sapwood completely surrounds the more impenetrable heartwood in the interior. The sapwood of practically all species when air seasoned can be made readily to absorb the preservative without artificial pressure. The penetration of the heartwood is a more difficult matter, as during the change from sapwood to heartwood various oils, resins and other organic substances are deposited in the wood cells, and make it much more difficult to inject the preserving fluids. All that is necessary, or, for the sake of economy, all that is really desirable, is to have the untreated interior of the pole surrounded by a thoroughly treated outer zone, deep enough to prevent danger of exposing the inner wood by checking or abrasion. This, in most cases, can be secured by the penetration of the sapwood. In some cases, particularly in the second growth pine of the South, it would be too expensive to penetrate the entire sapwood zone, and the treatment is regulated so that not more than the desired penetration is secured. When the zone of sapwood is very narrow the treatment should be made sufficiently severe to penetrate a portion of the interior heartwood.

It has already been intimated that by no means the least benefit to be derived from wood preservation is the opportunity it affords of obtaining from the cheap, so-called inferior kinds of wood a service equal to or surpassing that which is secured from the untreated timber poles of a better grade. Space forbids more than the briefest mention

of this phase of the subject—its importance deserves discussion in a separate paper. That the future pole supply of the United States will be affected fundamentally by the adoption of preservative methods cannot be doubted. In the South, the loblolly or old field pine can be reckoned as one of the great future sources of supply. In its natural state its life is merely a matter of a few years at most; but it can be given a cheap and simple treatment which will make it outlast the higher-grade longleaf pine or cypress. In the Rocky Mountain states there are millions of feet of dead pine and spruce—much of which is as sound and strong as when first it was killed by fire. Neither species is naturally durable, although the standing trees, in contact with the soil, remain sound almost for a generation. Such species possess every desirable characteristic of an ideal pole with the single exception of durability. Sound fire-killed timber is exactly similar to timber cut green and perfectly seasoned. Its strength is increased, it is lighter in weight and therefore easier to handle, and it is in a much better condition to absorb the preservative. As shown above, it can be so treated that not only is its first cost less than that of the imported cedar—but its term of service is longer by many years. In the Black Hills the insect-killed pine can be put to a similar use; and in California, western yellow pine has been treated to excellent advantage.

Thus the benefits of a rational policy of wood preservation are two-fold. In the first place, it makes possible the substitution of many cheap and abundant kinds of wood for the rapidly diminishing supply of the higher grades of cheap native timber for the expensive kinds imported from other parts of the country. In the second place it lengthens the life of the kind of wood already in general use for structural purposes, with a corresponding saving in the cost of maintenance. It is estimated that there are now in the lines of the United States more than 32 million poles of a length greater than 20 feet. The average life of all these poles, provided none were treated, would be approximately 13 years. The annual replacements, exclusive of new construction, would therefore approach 2½ million poles.

It is further estimated that if all the poles were treated an average increased life of slightly more than 10 years could be secured. In this case the annual replacement would amount to only about 1,380,000 poles, or a saving, due to preservative treatment of more than one million poles per year. Now, if we were to assume further that the average initial cost of each of the poles in use is $4.00, the cost of replacement $3.00, and the cost of treatment $1.50, the average annual charge per pole would be $0.78 untreated, as compared with 69 cents for every treated pole—or an annual saving of 9 cents for each of the 32 million poles in the lines of the United States—amounting in the aggregate to $2,280,000.

Economical Development of Toll Territory*

By Frank F. Fowle

There is no more important branch of telephone engineering than the design of circuits and apparatus for proper transmission and no subject, perhaps, of which the importance is less appreciated by many small telephone companies. Until small companies have grown to considerable proportions or attempted to give toll service over considerable distances they have probably not encountered the transmission problem. Rule-of-thumb methods instead of engineering methods prevailed in the design and erection of many small systems, and while the results obtained were perhaps satisfactory at first, this was not long the case after rapid growth and expansion set in. The first installations of lines and apparatus have been found in many cases to possess marked limitations in meeting the transmission requirements of a toll system, and the remedy, in some instances, is nothing less than reconstruction of plant and replacement of inefficient equipment. The means of preventing this consist of properly laying out the plant before it is built, on the basis of economical engineering standards, with proper regard for the future requirements which will arise as the development increases and the system expands. It is intended to point out, in what follows, the fundamental principles of transmission design without going into intricate theories.

Electrically the efficiency of a transmission circuit, or toll line, depends upon four properties which the circuit possesses; these are the ohmic resistance, the inductance, the electrostatic capacity and the leakage. Efficiency increases with the decrease of resistance, the increase of inductance, the decrease of capacity and the decrease of leakage; high efficiency therefore requires low resistance, high inductance, low capacity and high insulation (low leakage). The efficiency of telephone transmission is composed of two factors, the efficiency of the line circuit, and the efficiency of the telephones. Since an increase of one factor will offset a decrease in the other without affecting the net result, it follows that with a given standard of transmission the highest possible talking efficiency of the telephones will permit the lowest efficiency of the line circuit. Since the cost of a line of given length increases with the efficiency, it follows that economy in toll plant investment depends upon the highest attainable talking efficiency of the telephones which will be served by the system. This in turn depends upon securing the best obtainable transmitters, receivers, induction coils, repeating coils, condensers and other apparatus associated with the talking set that the market affords. It depends also upon furnishing the largest amount of transmitter current that the transmitter will carry without injury. In the magneto system this implies at least three cells of local transmitter battery and as much more as the transmitter will stand; in the common battery system it implies low resistance subscribers' lines and high voltage central office battery. The unusually long subscribers' lines in common battery districts can profitably be furnished with transmitter current from local battery at the subscriber's telephone or by means of a booster battery at the central office. The talking efficiency decreases with an increase in the length of the subscriber's line much more rapidly in the common battery system than in the magneto system; this is on account of the effect of the increasing resistance of the subscribers' line, which cuts down the transmitter current in the common battery system. Twenty-four volt batteries are not adequate for the long lines and forty-eight volts has been used with considerable improvement.

Transmission standards are commonly stated in terms of the length of a circuit of given resistance, inductance and capacity (no leakage) with certain telephone equipment at each terminal arbitrarily taken as a standard. For example, 25 miles of No. 19 B. & S. gage cable, copper conductors of 98 per cent conductivity and .054 microfarad mutual capacity per mile, is

*Paper presented at the Convention of the International Independent Telephone Association, December 2, 1908. Continued from issue of January 2, 1909.

illustrative of how standards are stated. The consensus of engineering opinion as to what constitutes a standard of ample volume and proper quality has advanced almost continuously since the beginning of the art toward louder standards. Every step towards louder standards increases the plant costs, and increases them in faster ratio than the improvement in volume of transmission. It is assumed in the previous statement that the means of improving transmission, after the most efficient telephones have been obtained, consist of increasing the amount of copper in the line circuits and, wherever possible decreasing the electrostatic capacity. An indiscriminate choice of a transmission standard is not possible, because too good a standard will raise the plant costs and the rates beyond what is necessary or reasonable, and a poor standard will result in poor service and loss of business. A standard equal to or the equivalent of 30 miles of No. 19 B. & S. gage cable .054 mfd. per mile mutual capacity, has been considerably recommended for toll service. Better standards have been considered and used in large, well developed plants, but they are believed to be burdensome to small plants whose development is not large at the outset. The following table gives the weight per mile of wire necessary for transmission equal to the standard of 30 cable-miles, over varying distances; these figures were obtained by calculation from theory and are in substantial accord with what actual comparisons have been made:

Table of Wire Weights Per Mile for Metallic Circuit Transmission Equal to 30 Cable Miles of No. 19 B. & S.

Distance in Miles.	Weight of One Wire Per Mile Copper.	Iron
100	.....	180 lbs.
150	.....	450 lbs.
200	.....	750 lbs.
300	115 lbs.	.....
400	175 lbs.	.....
500	230 lbs.	.....
600	290 lbs.	.....
700	350 lbs.	.....
800	410 lbs.	.....
900	470 lbs.	.....
1000	530 lbs.	.....

The table is based on open-wire construction, with the wires of a circuit spaced twelve inches apart. It is essential to reckon the transmission losses between the subscribers' telephones and the toll offices at each end of the most severe connection, reduce these losses to terms of the standard, subtract their sum from the latter, and proportion the toll line to be the equivalent of the remainder. The transmission losses at all intermediate switching and testing offices must be taken into account in a similar manner. It is not possible, of course, to choose the size of wire which will give exactly standard transmission, no matter in what connection it is used. A few sizes of wire must be chosen and employed as the standard sizes, in order that different circuits may be used interchangeably as far as possible. About three sizes are recommended as sufficient, one for short haul service, one for medium haul and one for long haul. The distribution of total wire mileage between the several wire sizes may be checked by a comparison with Fig. 3, and if, for example, one size of wire is designed to handle traffic of 100 miles haul or less, then the mileage of such wire in proportion to the total should be in the neighborhood of 40 per cent. On account of the low tensile strength of copper wire in the smaller sizes, iron may be preferable for much of the short haul business, and it is superior if the line spans are long. The following table of cable ratios will be found useful:

Table of Ratios of Metallic Circuit Open-Wire Mileage to Cable Circuit Mileage.

Cable Conductors. B. & S. Gauge.	Mutual Static Capacity.	Miles of No. 8 B. W. G. (435 lbs. per mile) Circuit Which are Equal to One Mile of Cable Circuit.
22	.069 mfd.	45.6
19	.054 mfd.	28.5
16	.065 mfd.	22.2
13	.065 mfd.	15.7
10	.090 mfd.	13.0

The wire sizes that have been made considerable use of in toll systems are the following:

Copper, No. 14 N. B. S. G., 102 lbs. per mile.
Copper, No. 12 N. B. S. G., 173 lbs. per mile.
Copper, No. 8 B. W. G., 435 lbs. per mile.
Iron, No. 12 B. W. G., 165 lbs. per mile.
Iron, No. 10 B. W. G., 250 lbs. per mile.
Iron, No. 8 B. W. G., 378 lbs. per mile.

The extreme distances over which each one of these wires will give transmission equal to 30 cable-miles, with standard telephones at each end of the circuit and no intermediate cable or apparatus of any description, are as follows:

Character of Circuit.	Limiting Distance For Transmission Equal to 30 Cable-Miles of No. 19 B. & S.
Copper No. 14 N. B. S. G.....	250
" No. 12 "	400
" No. 8 B. W. G.....	850
Iron No. 12 "	90
" No. 10 "	120
" No. 8 "	135

The complete design of a plant in respect to transmission efficiency must take into account the losses of every character, including those occasioned by cord circuits and cord circuit apparatus, local trunks and their associated apparatus, toll board apparatus, local office and toll office multiples, office cable runs, phantom circuit coils, simplex and composite sets, composite ringers, protective apparatus and, in general, all apparatus connected in series or bridged relation with the talking circuit at each point.

At rural offices it is usually possible to terminate toll lines on a pole within a few feet of the office, but in large towns and in cities it is frequently necessary to terminate the open wire line some distance from the office, and bring the toll circuits to the office through cable, usually underground. For any fixed standard of transmission over a circuit of fixed length composed partly of open wire and partly of cable there is a best relation between the size of open wire and size of cable conductor. That is, there is a particular size of open wire and a particular size of cable conductor which will give transmission equal to the standard at a minimum investment, and any other combination of wire and cable will require a greater investment. The use of No. 22 B. & S. and No. 19 B. & S. gage cable in toll circuits of any considerable length is, for this reason, to be condemned. In extreme cases it will be economy to use cable conductors of a size equal to the open wire, where the latter is copper. The test for determining whether the best combination of open wire and cable has been selected is as follows: compute the cost of improving the transmission by an amount equal to one cable-mile of No. 19 B. & S., first by increasing the size of the open wire, and, second, by increasing the size of cable conductor; when these two costs are equal the best combination has been obtained. When it is necessary to carry a few toll circuits through subscribers' or local trunk cables, it will be economy to provide cables with a few pairs of large gage, No. 13 or No. 10 B. & S., for the toll circuits; a study of each particular case will indicate what is best to use.

Generally speaking it has been found a difficult matter to maintain initial transmission efficiencies in a toll plant as it grows larger. The tendency of development is to increase the percentage of toll wire mileage in cable, and the whole tendency of the art has been toward general complication and more elaborate apparatus. So far as the development can be foreseen, this progressive loss of efficiency can be avoided, first by making a proper engineering study of the plant as it will be ultimately, 15 or 20 years in the future and, second, by adopting transmission standards at the outset which will provide a proper volume of transmission when the ultimate has been reached. Unless this is done, only rare good luck can prevent a gradual loss of efficiency.

It is not possible in a paper of this sort to give plant costs which will apply universally to all parts of the country, or to different sized towns and cities in the same part of the country. There is necessarily a variation in the cost of right-of-way, freight charges on material and equipment, the cost of labor, the cost of earth excavation, the effect of the climate, etc., which all depend upon conditions in each locality, and its relation to the market for supplies and material. Average values have been sought, and it is the purpose to show proper methods of computing plant charges, as well as the actual charges. It has been assumed that depreciation shall be provided for by charging off annually, out of revenue, an amount equal to the cost of replacing the original plant at the expiration of its life, minus its junk value, divided by the number of years in its life. Some estimators have used the first cost instead of the replacement cost, but this is correct only upon the assumption that the company is going out of business when its plant wears out. As a going concern it will need to replace its worn-out plant, and therefore the replacement cost is the proper one to consider. The junk value of the old plant is an asset which should be deducted from the cost of replacement. The items composing the annual plant charge are as follows, stated in the order in which they must be met:

1. Maintenance.
2. Taxes.
3. General expense.
4. Depreciation.
5. Net Earnings.

The third item, general expense, is not intended to cover the entire general expense of the business, but only such a pro rata as may be charged against the plant. The method employed by the writer to arrive at the annual charges is indicated by the form given in Fig. 10. Copper is taken at $0.15 per pound and iron of BB grade at $0.035 per pound. The junk value of copper is commonly a few cents per pound less than the prevailing market price for wire. A price of $0.15 per pound is believed to be a fair average, taking into account the market fluctuations for some years past; $0.10 per pound is abnormally low and has been used, therefore, as a safe junk value. The junk value of worn-out iron wire is hardly worth taking into account, and nothing whatever can be realized if it must be handled several times and shipped a considerable distance to a market; a value of $0.004 net per pound has been assumed. The life of copper wire is not definitely known. The direct effect of exposure to all sorts of weather is not known to produce any appreciable result in causing progressive oxidization or corrosion and there is no progressive increase of resistance with age. The principal causes of deterioration are high winds and sleet storms, which gradually elongate the wire and impair its strength. The wires in time become slack, and every few years the slack must be removed. Tie-wires tend, from these causes, to become loose and cause wire trouble. The assumed life of 50 years is taken in order to be conservative, and not from any existing data. It is definitely known that copper wire which has been in service 25 years has suffered no direct deterioration, but as to how long it will ultimately last there is no experience from which to decide. The life of iron wire is not so indefinite. The grade of Swedish iron which was employed in wire making many years ago proved much superior in its lasting qualities to the mild steel which is now used. An average life of 15 years at the present time is believed to be conservative; the ohmic resistance of wire which lasts for a longer period will most probably increase somewhat on account of the reduction of cross-section by rust. The general expenses are taken as 10 per cent of the sum of depreciation, maintenance and taxes.

The average annual charges per mile of circuit, for a 25-foot pole line carrying two circuits of No. 12 iron, two of No. 14 copper and one of No. 12 copper, are $30.20. Had this line been erected with only one circuit of No. 12 iron and one of No. 14 copper, the average annual charges per mile of circuit would be $65.09. Upon the addition of another circuit of No. 12 iron, the charges would be reduced to $45.29; upon the addition of the No. 12 copper circuit, they would be reduced again to $36.17. Fig. 11 shows the detail computation of the annual charges upon a 30-foot pole line carrying ten circuits; the average annual charge per mile of circuit is $25.32. Had this line been erected with only three circuits of No. 10 iron, one circuit of No. 14 copper and one circuit of No. 12 copper, the average annual charge per mile of circuit would be approximately $41.00; the average charge will diminish as the balance of the circuits are erected.

The limit of loading circuits upon a pole line is necessarily determined by the mechanical strength of the system, adequate reinforcement and guying being always presumed. Overloading of lines is to be avoided because it will increase the cost of maintenance, through increased failures resulting from high winds and sleet storms. Such failures cause losses in three ways,—the direct expense of repairs, the loss of revenue occasioned by interruption to the service, and the subsequent loss of patronage which arises from a public sentiment that the service is unreliable. There is no way to compensate for these losses once they have occurred, and the only thing to do is to prevent their recurrence. But they may be prevented in the first instance, and it is on the basis of adequate strength that the preceding charges have been computed.

2 miles of No. 12 B. W. G. iron circuit.
2 miles of No. 14 N. B. S. G copper circuit.
1 mile of No. 12 N. B. S. G copper circuit.

	First Cost	Cost of Reconstruction	Junk Value	Average Lift in Years	Annual Value of Depreciation	Annual Cost of Maintenance	Annual Taxes 1%	Annual General Expense	Annual Net Earnings 10%	Total Annual Charges
Right-of-way	$ 50.00	.....	.....	..	.....	$ 1.00	$ .50	.....	$ 5.00	$ 6.50
Trimming	40.00	.....	.....	..	.....	1.00	.40	.....	4.00	5.40
Pole line (Cedar)	180.00	$440.00	.....	12	$36.70	15.00	1.80	$8.71	18.00	80.21
Guying	30.00	45.00	.....	12	3.75	3.00	.30	.....	3.00	10.05
Cross-arms (Pine)	50.00	60.00	.....	8	7.50	3.00	.50	.....	5.00	16.00
Copper wire No. 14 N. B. S. G.	87.70	107.70	$40.80	50	1.34	1.60	.88	.....	8.77	12.59
Copper wire No. 12 N. B. S. G.	65.40	75.40	34.60	50	.82	.80	.65	.....	6.54	8.81
Copper wire No. 8 B. W. G.	.....	.....	.....	..	....	.....	.....	.....	.....	.....
Iron wire No. 12 B. W. G.	49.00	69.00	2.50	15	4.43	1.60	.49	.....	4.90	11.42
Iron wire No. 10 B. W. G.	.....	.....	.....	..	....	.....	.....	.....	.....	.....
Iron wire No. 8 B. W. G.	.....	.....	.....	..	....	.....	.....	.....	.....	.....
Total	$552.10	$797.10	$77.90	..	$54.54	$27.00	$5.52	.....	$55.21	$150.98
		Average Annual Charge Per Mile of Circuit, $30.20.								

Fig. 10.—Table of Annual Charges on One Mile of 25-Foot Line.

Generally speaking, the annual charges diminish as the wire load on the pole line increases. This load is commonly spoken of as the miles of wire per mile of pole line, and is a very important quantity in toll systems. One exception to this may be noted in the case of replacing a fully loaded line with a new line of larger capacity, at which time there may be an increase in the average charge per circuit. At the time of such replacement several circuits are usually added to the line, and in that case the resulting increase in the average charge, if any, should be small. The charges per circuit on a 35-ft., 40-wire line will be less than in the case of the 20-wire line given in Fig. 11. The cost of construction at and near terminals in towns and cities is usually greater than out in open country, because of the necessity of painting poles and crossarms, increased cost of right-of-way and franchises, inability always to follow the most direct routes and the necessity sometimes for tall lines which will clear shade trees. On the other hand this is sometimes offset to a degree by building very heavy lines for the joint occupancy of several toll lines from the outskirts of a town to the terminal within the town. The terminal sections should always be separately figured upon in estimates. In many cases the failure to build adequately heavy terminal lines has resulted in overloading when it became necessary to join a new toll line with a line hitherto existing.

5 miles of No. 10 B. W. G. iron circuit.
3 miles of No. 14 N. B. S. G. copper circuit.
2 miles of No. 12 N. B. S. G. copper circuit.

	First Cost	Cost of Reconstruction	Junk Value	Average Lift in Years	Annual Value of Depreciation	Annual Cost of Maintenance	Annual Taxes 1%	Annual General Expense	Net Earnings 10%	Total Annual Charges
Right-of-way	$ 50.00	.....	.....	..	.....	$ 1.00	$ .50	.....	$ 5.00	$ 6.50
Trimming	50.00	.....	.....	..	.....	1.00	.50	.....	5.00	6.50
Pole line (Cedar)	300.00	$660.00	.....	12	$55.00	25.00	3.00	$14.00	30.00	127.00
Guying	40.00	60.00	.....	12	5.00	5.00	.40	.....	4.00	14.40
Cross-arms (Pine)	90.00	110.00	.....	8	13.75	5.00	.90	.....	9.00	28.65
Copper wire No. 14 N. B. S. G.	131.50	161.50	$61.00	50	2.00	2.40	1.32	.....	13.15	18.87
Copper wire No. 12 N. B. S. G.	131.00	151.00	69.00	50	1.65	1.60	1.31	.....	13.10	17.66
Copper wire No. 8 B. W. G.	.....	.....	.....	..	....	.....	.....	.....	.....	.....
Iron wire No. 12 B. W. G.	.....	.....	.....	..	....	.....	.....	.....	.....	.....
Iron wire No. 10 B. W. G.	152.50	202.50	10.00	15	12.85	4.00	1.52	.....	15.25	33.62
Iron wire No. 8 B. W. G.	.....	.....	.....	..	....	.....	.....	.....	.....	.....
Total	$945.00	.....	$140.00	..	$90.25	$45.00	$9.45	$14.00	$94.50	$253.20

Average Annual Charge Per Mile of Circuit, $25.32.

Fig. 11.—Table of Annual Charges on One Mile of 30-Foot Line.

The charges per mile of circuit upon the short underground sections at the terminals depend to a great extent upon local conditions and the number of toll circuits in cable. These charges may be computed by the same method used for pole lines. In general they will vary from about $5.00 per mile for small conductors in large underground systems, upward to amounts equaling the charges for open-wire circuits. When the toll circuits are few in number and require large gage conductors, the use of so-called composite cables is economical when the local plant is in cable. Such cables contain conductors of two or more gages, each gage suited to a particular class of service; three gages have been used with considerable economy and satisfaction. The placing of toll circuits wholly in cable is feasible in large systems for the short haul traffic between important centers. When the use of loading coils becomes permissible the range of distance for toll circuits wholly in cable will be much extended, to 100 miles and upwards when the volume of traffic warrants it.

When rates are computed upon an air line basis it becomes necessary to increase the circuit charges as computed above in order to compensate for the longer mileage of actual pole line as compared with the air line mileage. This, of course, will be computed for each particular system. At the same time that the charges are thus increased some allowance should be made for the extra terminal costs, railroad crossings, the protection of crossings with high-tension power transmission lines and any other special conditions. These matters will naturally take care of themselves in a detailed estimate, but for the purposes of further discussion it will be assumed that the actual mileage of pole line is 20 per cent in excess of the air line mileage, and that 5 per cent should be added for the other items, making a total increase of 25 per cent. For example, the average charge per circuit mile on the 25-ft. line of Fig. 10 would become $37.75 per annum, on an air-line basis.

(To be concluded.)

Pap's Weather Alarm.

The following has been going the rounds of the papers for the last few days:

Old Pap Peters, a resident of a small Southern town, has discovered an absolutely new use for telephone wires.

"Be you a lawyer" inquired Pap, who went limping into a lawyer's office.

"Yes, sir; I am a lawyer. Sit down."

"I want you to fetch a lawsuit against the telephone company. Can you fetch lawsuits against them?"

"Yes, sir; we can sue them, all right. What's the matter?"

"Well, you see, Squire, I live out yonder in the Deer-hollow neighborhood, and runs a truck patch. Them telephone folks come along and sot up a big post at the corner of my fence, right nigh the gate."

The lawyer's face brightened. "Oh, yes! I see. It interferes with ingress and egress to your property; additional servitude, and—"

The old man looked bewildered.

"No, Squire; lemme finish a-tellin' you. That post is been thar nigh on to twenty year, and it's stuck fuller of wires than the hair on a hog's back; and when the weather's a-goin' to turn cold all them wires begins to sing. I kin lie right thar in my bed and hear 'em. So I gits up and goes and kivers my cabbages. Them telephone men come along an' moved that post and tuk them wires more'n a quarter of a mile away. Now I can't hear 'em sing no mo'. Last night thar come a frost an' all my cabbages got friz, and now I wants to sue the corp'ration."

Only One Husband.

A woman called the La Jara telephone "central" the other day and said: "I want my husband." The operator, not knowing who her husband was, said: "Number, please." "For the Lord's sake, how many husbands do you think I've got?" asked the woman.—*Transmitter.*

Telephone Development in New Zealand

Statistics published in the *Journal Telegraphique* show the extent of the telephone system in New Zealand, the figures being abstracted from a report for the year ending March 31, 1908.

The figures for the length of pole lines, and wires, in kilometers are as follows:

Length of line—March 31, 1907, 1,525 km.; March 31, 1908, 1,672 km.

Length of wires—March 31, 1907, 24,272 km.; March 31, 1908, 29,972 km.

Accordingly, there was during the year an increase of 147 km. of lines, and 5,500 km. of wire.

The number of stations was increased during the year by 6,478, that is, from 17,403 to 23,881.

The number of subscribers in each of several of the largest offices was, on March 31, 1908, as follows: Wellington, 3,781; Auckland, 3,184; Christchurch, 2,978; Dunedin, 2,713; Napier, 726; Wanganui, 681; Invercargill, 635; Gisborne, 626; Palmerston North, 580; Hastings, 463.

Independent Long Distance from Montreal to Toronto.

A recent issue of the *Daily Star*, Montreal, Canada, contains the following:

"The sum of $1,500,000 has been deposited with the Bank of Hamilton, at Hamilton, Ont. It is to be used by an Independent telephone company, already established in Toronto, with a charter covering rights to operate out of Toronto, and within two weeks construction work will be commenced between Montreal to Toronto.

"The men behind the movement are C. H. Silliman of New York, and F. H. Stillman, president of the Watson-Stillman Company, and president of the Machinery Club of New York.

LETTERS ON PRACTICAL SUBJECTS

Wave Distortion in the Carbon Transmitter.

I have read the article on wave distortion in carbon transmitters, appearing in the November 14 TELEPHONY, with interest, the more especially as there is a great paucity of precise data regarding the behavior of the microphone as a source of alternating currents. The general solution of the differential equation developed by Mr. Hill is, however, very difficult to interpret physically, and I rather fancy he is not quite happy about it himself. It is stated that the expansion of the right hand side of equation (6) by Maclaurin's theorem (which, it may be noted, is not done by the aid of Maclaurin at all, but by the common exponential series) is rapidly convergent; but is this really the case? It would seem that as $\frac{R}{L}$ is quite a large number in the case in question, and t presumably may be anything, the series cannot be other than divergent, and consequently meaningless. If the said expansion be really effected by Maclaurin and integrated, we get the following series:

$$\epsilon^{-\frac{Ra}{L\omega}\}t+\frac{R}{L}\frac{t^2}{2}+\frac{1}{6}t^3\left(\frac{R^2}{L^2}+\frac{Ra\omega}{L}\right)+\ldots.\}$$

which is also divergent. Again if the exponential term on the left hand side of (8) be brought over to the right, it should multiply both the series and the constant of integration instead of the former alone, as shown in the paper. As, however, this exponential factor appears to be evanescent, it is hard to grasp the meaning of the whole process. The kind of answer which it seems to me one ought to get is a forced vibration + an evanescent term, and if the integral could be directly evaluated the equation might produce such a result, though I do not see how to manage it. Perhaps your contributor may have something further to say about the matter. However, this is by the way, since the primary inductance of a local battery set is usually an unimportant factor except for high tones, and the approximation (13) should be good enough. How far the presence of the octave goes to explain the unintelligibility of some lady subscribers, it is not easy to say, as there are many other more serious distorting influences in a telephone circuit than this one, e. g., resonance in the moving parts of transmitters and receivers which is very marked in most commercial instruments; still the theory embodied in the paper is an instructive one.

London, Eng. G. M. Shepherd,
National Tel. Co.

Preventing Cable Troubles.

I noticed the letter on cable trouble in your issue of November 21, by Mr. Heineman, of Wausau, Wis. As Wisconsin is my native state, it was particularly interesting to me; and, with Mr. Heineman's permission, I would like to suggest some ways of preventing cable troubles such as he describes.

First—Tree or limbs should never be allowed to grow up to a cable, let alone rubbing it. Cable must not rub against anything.

Second—Cause of trouble from lightning; to prevent this ground your cable sheath every six or eight poles with No. 6 copper wire, taking special precautions at curves and corners.

A good plan for cable construction: After having the corners and curves all properly guyed, run your messenger on the street side of the poles, and at all curves use heavy eye bolts.

When the messenger is run out, it should be pulled as taut as 3 or 4 men can pull it, with two pairs of good blocks, then cinch it. Have one of the linemen ride out to the center of the first span, and if there is more than 12-in. slack (in a 100-ft. span), it is not taut enough, and you will have to put on another pair of blocks and pull again. Keep this up until a 160-lb. man will not sag the messenger more than 12 ins. Great care should be taken never to get any short kinks in cable. In order to keep all unnecessary strain off cable while pulling it through the trolleys, keep a man on every pole at curves, and at corners you should have two men. Use plenty of trolleys and the men can keep it running smoothly at curves and corners.

I had a peculiar cable trouble two years ago. We had a 25 pr. cable running about eight blocks and it began to give us trouble by cross talk. Then we got opens, shorts and grounds. On testing, we found the trouble about one and one-half blocks back from the office. Some one in shooting sparrows with a .22 cal. rifle had shot a bullet through the middle of the sheath, the ball lodging in the center of the cable. It was about in the middle of the span. We had to cut and splice, which was quickly done after locating the trouble. So much for sparrow shooting where there is cable!

Decker, Ind. J. F. Breithaupt, Manager,
Wabash Home Telephone Company.

Vent in Battery Cabinets.

I have noticed several cabinet style battery casings which have been reported as continually damp, and in which the sand put in the trays to level the cells was wet. On investigating it was found that the cabinet was installed with a 3x6 in. vent at the top, but no opening of any kind at the bottom. By putting several 1-in. holes in the ends, at the bottom, we have obtained a fairly good vent.

Texas. E. E. F.

Telephone Law

Conducted by A. H. McMillan

Telephone Rules and Rentals.

Please answer through TELEPHONY, the following questions. We are known as the —— Co-operative Telephone Company.

First, if we rent a telephone for 15 months, and the party moves away in 12 months, have they a right to take the telephone with them and use it in another company without our consent?

Second, if parties on our line fail to pay according to our rules, have we the right to cut them off from service? I mean would it be lawful?

First: A subscriber has no right to take his instrument away with him and use it with another company without your consent.

Second: If a subscriber on your line fails to pay according to your rules, you may legally cut him off from service.

Justifiable Refusal to Furnish Rates.

The Red Line Mutual Telephone Company has its principal place of business at Burr Oak, Kan., and is authorized to transact business in Nebraska. In May, 1905, it extended its line to Superior, Neb., passing the home of Henry L. Pharris, six miles west of Superior. Previous to the construction of the extension, Pharris and others had become subscribers for stock in the company. Before the line was completed, it became apparent that one wire would be inadequate for the service, and as a result another wire was placed along the same route from Superior to Mr. Pharris' home. The short wire was known as "line 224," while the wire from Burr Oak to Superior was known as "line 225." When the line was constructed, both wires were run to Pharris' telephone, where a switch belonging to him was installed, so that he was enabled to use either wire. Pharris contended that his subscription, and a verbal agreement made at the same time, amounted to a contract, whereby he was to be connected with line 225; that afterwards the company proposed to attach only line 224 to his telephone and upon his insisting, the company agreed to and did install the switch and connected it with both the lines, substituting an agreement to this effect for the original contract.

The president of the company asserted that he put the line switch in on his own responsibility with the understanding that he would report it to the board of directors, and if they disapproved, Pharris would take it out. On the board of directors disapproving of the installation of the switch, the company ordered it disconnected. Pharris disregarded this order, and when the company disconnected the wire leading from line 225 to defendant's switch, he reconnected it and threatened to do so as often as the company would disconnect. The company then brought suit to enjoin Pharris from interfering with its line.

The Supreme Court of Nebraska upheld the District Court for Nuckolls county in giving judgment for the company. It found that the company's version of the matter was correct, and that its lines were burdened to their full capacity by other connections so that the maintenance of the switch by Pharris would have a demoralizing effect upon their other subscribers.

Red Line Mutual Telephone Company v. Pharris, 117 N. W., 995.

A Year's Notice Required to Terminate a Contract.

The suit of the Tri-State Telephone Company against the Windom Mutual Telephone Company has been decided at Minneapolis, Minn., by Judge Purdy of the Federal Court. The suit was based upon a contract between the parties in which there was the following clause: "This contract shall remain in force and effect five years from the date hereof, and thereafter, until one year's notice in writing is given by either party of its intention to terminate the same." The contract was dated October 12, 1903, and no notice of any intention to terminate it was given until a few days before the 12th of October, 1908, when the Windom Mutual Telephone Company notified the Tri-State Telephone Company that the contract expired by limitation on the 12th of October, 1908, and that the Tri-State Telephone Company would be required on that date to remove its wires and sever its connection with the Windom Company. This step was taken upon the advice of the attorney for the Northwestern Telephone Exchange Company, which is the Bell Company at Minneapolis. The Tri-State Company went into the Federal Court and obtained an injunction restraining the Windom Mutual Telephone Company from declaring its contract at an end, upon the ground that the contract did not terminate until one party or the other had given a year's notice in writing. The Northwestern Telephone Exchange Company and its officers were also joined as defendants, one of the grounds upon which the restraining order was asked, being that the Northwestern Telephone Exchange Company was conspiring with the Windom Mutual Telephone Company to have the latter declare its contract at an end and grant it the privileges which the contract gave to the Tri-State Company. The court upheld the contention of the Tri-State Company, which was represented by Attorney Harlan P. Roberts.

Liability of Company for Setting Defective Poles.

A telephone company gave each of its linemen a printed notice setting forth their duties, and stating, among other things, that "All linemen and other employees of the company, whose duties require them to work upon or about poles are especially charged with the duty of inspecting the implements with which they work, all poles, crossarms and wires, and must know that they are safe to work with or upon before climbing or going upon such poles and crossarms." The Supreme Court of Nebraska held that notwithstanding this notice, the company in the construction of new lines of telephone in which it employed two gangs of workmen, one known as the "ground man," who set the poles, and one known as the "lineman," who strung the wires, could not escape liability for setting a defective pole, from the breaking of which a lineman was precipitated to the ground and injured. The court, in making its decision, said that it knew of no rule of law which would allow the master by contract or otherwise to release himself from liability for negligently allowing a dangerous condition to be created by one set of employees engaged in one employment, and the risk of this dangerous condition imposed upon another set of employees engaged in a different employment. The court held that the men employed in the gang of linemen were not fellow servants with those employed in the gang of groundmen.

Ault v. Nebraska Telephone Company, 100 N. W., 73.

Admissibility of Telephonic Conversation.

In Barrett v. Magner, decided by the Supreme Court of Minnesota, a witness testified that he secured telephone connection with the place of business of a party; that some one answered, and stated that the person wanted was not in, but would be called, and that soon thereafter another voice answered, and a conversation took place respecting a business transaction. The conversation was admitted in evidence in view of the fact that the witness further stated that the talk over the telephone was of the same character as one occurring a few days previous in a personal conversation between the same parties.

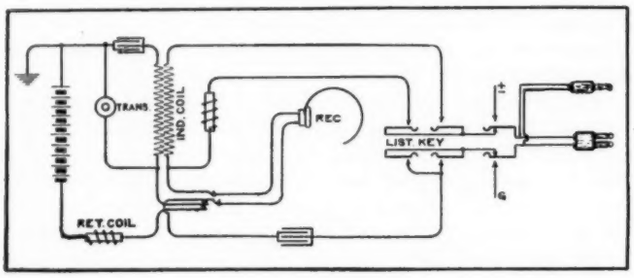
Barrett v. Magner, 117 N. W., 245.

Practical Questions and Answers

Toll Board Equipment.

In the article "Modern Toll Switchboard Equipment," Nov. 14 issue, in the description of the circuit shown in Fig. 47, it says it is so designed that it cannot be used for monitoring. Wired to twin plugs, as shown in Fig. 47, why could it not be used to cut in on the telephone circuit; also how could you make connection with the wire chief trunks, as shown in Fig. 51, Nov. 21 issue?

Referring to Fig. 42, Nov. 14 issue, are not the line and switchboard connections shown reversed? If composite coils were cut



into the line at jacks 1 and 3, and you cut the telephone circuit in at jack 2, would it not be on the line side of the coils and thereby cross the "Morse"?

Possibly I did not read the diagram right, but would like it further explained if I am wrong.

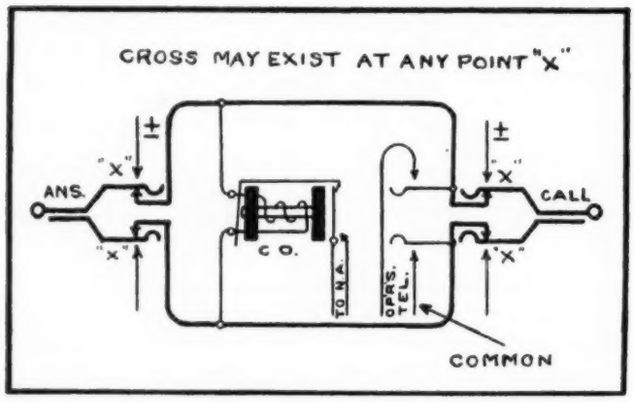
The circuit as shown in Fig. 47 could not be used for monitoring since the operator would, upon plugging into the line jack, open the line by means of the break contacts in said jack.

Connections with the wire chief's trunks are made by means of a two-conductor plug wired as shown in the accompanying sketch.

As suggested the line and switchboard connections in Fig. 42 are shown reversed, and the "Morse" would be crossed if the telephone plug were inserted into jack No. 2. This was a slip in lettering the drawing, and for the correct circuit we refer to Fig. 24, Art. 7 of "Modern Toll Switchboard Equipment."

Switchboard Noise.

We have an express type switchboard. Our lines are what we call ground lines. We have a Warner pole changer. When using a certain pair of plugs the operator can hear the buzzing of the vibrator on any of the lines she may listen in on. The subscribers hear the noise, too. When the connections are all down and

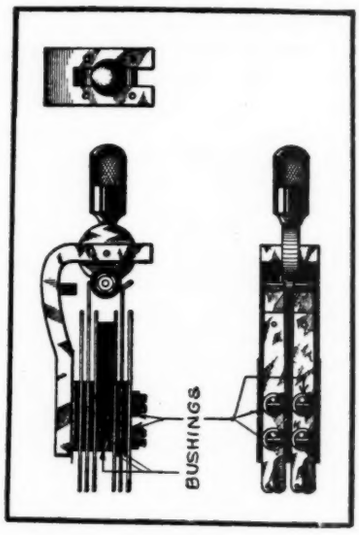


the key is thrown in the listening position the buzzing begins and continues as long as the key is in the listening position. If the key is off, the noise stops, unless we are using the plugs corresponding to said key, if so, the buzzing continues till they are taken down.

Please show by diagram where the trouble is, and tell how it may be fixed.

All other connections are quiet.

This trouble undoubtedly exists in the ringing and listening key of the particular pair of cords in trouble, and since the keys are all tied together by means of the listening commons the trouble is transferred to the other cord circuits by means of these commons whenever the listening key in the defective circuit is operated. This trouble can be attributed to either a defective bushing in the key, or a short between the springs of the key due to some foreign metallic material lodged between the springs of the key. The best way to clear this trouble is to give the key a close inspection for any foreign matter, and in case this does not reveal the source of trouble, the leads to the key springs should be unsoldered, and each spring tested for crosses with every other spring and the frame of the key. This test



should be made with a generator and bell, as the cross may be a high resistance one which a battery and buzzer would not reveal.

Current for Lighting Lamps.

We have in use here a transfer trunk circuit, the drawing of which I enclose. The description is as follows: We are reducing, through a transformer, 110 volts a. c. to 15 volts for lighting trunk lamps. As you will see by the drawing, in our trunk circuit, we have two 4-volt lamps in series. There is a manufacturing concern here that uses electricity for welding purposes, which causes the current to fluctuate to such an extent that the current, when low, lights the trunk lamps dimly; then it will suddenly come on with such force as to burn out such lamps as are in service at the time it makes the jump. This makes our lamp expense very high, and a remedy would be heartily appreciated.

It is easy to see that you must continue to get lamps burned out with the arrangement you describe.

It is probable that, at the welding factory, the machine is speeded up as the load comes on; and then, when the welding load goes off, your lamps get an extra heavy current through the transformer. Two 4-volt lamps in series across a 15-volt lead means that the lamps are constantly carrying an overload current of almost 50 per cent. Four 4-volt lamps in series across 15 volts would be on the safe side, when the fluctuation of the supply circuit is great. This naturally means that when the voltage of the supply mains is low the candle power of each of the four 4-volt lamps in series would be much lower than where only two 4-volt lamps in series were used. Using four 4-volt lamps in series will eliminate the burnouts, but then the welding concern will at times almost eliminate the candle power. Probably the best thing to do is to provide a steady source of direct current, in your exchange, for lighting the lamps.

Telephone News

Consolidation of Large Nebraska Independent Companies.

The Lincoln Telephone Company and the Western Telephone Company, both of Lincoln, Neb., have been consolidated with an authorized capital stock of $2,500,000. This is the largest deal of the sort ever completed in Nebraska. The name of the new concern is the Lincoln Telephone and Telegraph Company. The Lincoln business will be run in connection with the toll lines of the Western Telephone Company.

The following board of directors was elected: Frank H. Woods, George E. Haskell, S. H. Burnham, Charles J. Bills, Simon D. Mayer, Mark W. Woods, W. E. Sharp, A. O. Faulkner, Charles Stuart, John T. Dorgan, George J. Woods, Joseph Grainger and John W. McDonald.

The board of directors in turn elected the following officers of the Lincoln Telephone and Telegraph Company: President, Frank H. Woods; vice-president, S. H. Burnham; secretary and treasurer, C. J. Bills; general manager, L. E. Hurtz; superintendent of exchanges, M. L. Castor; traffic manager, George K. Gann.

In taking over the Lincoln Telephone Company, having securities amounting to $1,041,000, of which $641,000 was represented by bonds and preferred stock, the valuation placed on the property was $841,000, this reduction having been made because $200,000 had been distributed among investors as a premium at a time when the business was not considered to be such a safe venture as it has proved itself. Commenting on the financial situation of the new company, President Frank H. Woods is reported to have said:

"In forming the new company we have put it on a basis where it is actually earning a good return on its capitalization. We have accepted the minimum for risk and promotion. There isn't a bit of blue sky in the proposition. We have over a half million of stock now paid for, dollar for dollar, and we can earn over 8 per cent on it.

"The company will begin business with an actual capital of a little less than $1,100,000. We will attempt to sell stock thereafter only as the money is needed for extensions. The city is growing rapidly. Subscribers do not want to wait until we can pay for these extensions from our earnings. We need new capital for this and new stock will not be sold until we do. And when new stock is sold there will be no ground floor or inside sales; it will be $100 in cash for $100 of stock."

Nebraska to Have Big Convention.

Nebraska Independents will have the best convention in their history next week. Great progress has been made in strengthening the organization, and not only will there be a heavy attendance, and a thorough discussion of methods of improving business, but the program of speakers on live topics insures that the meeting will be second in interest only to the great national convention held last month. Beginning Jan. 13, and continuing on the 14th and 15th, at the Lindell Hotel, Lincoln, a program will be carried out which includes the following features:

Papers: "How to Keep Up Telephone Collections," Wallace Wilson, Fremont, Neb.; "Advertising Independent Toll Service," W. J. Stadelman, Norfolk, Neb.; "Toll Traffic," Geo. K. Gann, Lincoln, Neb.; "The Value of Good Telephone Service," L. E. Hurtz, Lincoln, Neb.; "Advantages of Closer Union Between Companies and Being Members of the N. I. T. Ass'n.," E. E. Stanton, Stromsburg, Neb., "Developing Telephone Business," C. H. Smith, Sioux City, Ia.; "The Work of Our Wire Chiefs," S. A. Hensley, Lincoln, Neb.; "Organizing and Financing Telephone Plants," F. H. Woods, Lincoln, Neb.; "The Necessity of Fixing Toll Rates and Charges Between Towns," Hon. T. H. Clark, Railway Commission, Lincoln, Neb.; "The Value of Competition," C. C. Deering, Omaha, Neb.

Among the distinguished guests and visitors who will take part in the program are:

Hon. C. A. Shallenberger, Governor of Nebraska.
Hon. F. W. Brown, Mayor of Lincoln.
Hon. W. A. Selleck, Pres. Lincoln Commercial Club.
E. H. Moulton, Minneapolis, Minn., Pres. Ind. Tel. Ass'n.
H. D. Critchfield, Chicago, Gen. Counsel Ind. Tel. Ass'n.
Hon. Ben S. Baker, Omaha, Neb.
J. H. Shoemaker, Waterloo, Ia., Pres. Iowa Tel. Ass'n.
W. H. Nelson, Smith Center, Kas., Pres. Kas. Tel. Ass'n.
M. L. Golladay, Holden, Mo., Pres. Missouri Tel. Ass'n.

The annual banquet will be held on the evening of the second day, January 14.

One of the most important features which will come up at the time of the convention is a discussion in accordance with the following order of the State Railway Commission:

Notice is hereby given to all telephone companies doing business in the state of Nebraska, that, for the purpose of acquainting itself with the conditions obtaining in this state, and preparatory to the issuance of certain regulations with reference thereto, the Nebraska State Railway Commission will hold a conference with the representatives of all the telephone companies, doing business in Nebraska, at its office in the Capitol Building, Lincoln, Nebraska, beginning at 2 o'clock p. m., January 15, 1909.

At which time the following questions will be considered:

A. Uniform System of Accounting.

1. Exchange. 2. Long Distance. 3. Depreciation.

B. Classification of Telephone Subscribers.

1. General—Business and residence.
2. Special—Rates with or without contracts to individuals, within the following general groups:
   - a. City, town, village, state, and county offices.
   - b. Social and other clubs, societies.
   - c. Churches and ministers.
   - d. Charitable organizations.
   - e. Public library.
   - f. Educational institutions.
   - g. Station and other R. R. offices.
   - h. Officers of company.
   - i. Stockholders of company.
   - j. Employees of company.
   - k. Barber shops.
   - l. Hotels.
   - m. Blacksmith shops.
   - n. Dry goods, and clothing stores.
   - o. Express offices.
   - p. Newspapers, and associated press.
   - q. Telegraph offices.
   - r. Farm lines.

C. Interchange of Service Between Telephone Companies, and Exchanges at Blanket Rates.

1. Open to all subscribers.
2. Limited to certain classes.
3. Switching service for other, and farm lines.

D. Long Distance Charges.

1. Reduced rates to subscribers.
2. Reasonable minimum charge.
3. Proper division of toll line charges, as between the terminal, and line charge.

E. Services Furnished for other than Monetary Consideration.

1. Stations, and other R. R. offices.
2. Places of a quasi-public character.
3. Churches, charitable institutions.
4. Social, and other clubs, societies.
5. Stockholders and employees of company.
6. Free service until completion of new lines, or perfecting of service generally.
7. Free local service from public toll pay stations.

F. Physical Connection for Long Distance Service at Non-Competitive Points.

The importance of attendance at this meeting is thoroughly realized by officers, managers and investors in all companies doing business in Nebraska, and there will be a large delegation of prominent telephone men from other states.

Combination of Large Independent Properties in Western New York.

The important telephone properties in western New York, which have been developed under the able leadership of Mr. B. G. Hubbell, of Buffalo, into one of the most extensive and successful operating systems in the country, are now to be operated as a unit.

At a stockholders' meeting of the Frontier Telephone Company and the Inter-Ocean Telephone and Telegraph Company, held last week, it was decided to sell the properties of those two organizations to the Federal Telephone and Telegraph Company, a New York state corporation organized on December 28, with a capital of $6,000,000, and later in the day the Federal Telephone and Telegraph Company organized and voted to purchase these two properties.

This change in organization does not in any way change the control of the Independent telephone business of western New York. The Federal Telephone and Telegraph Company will have, as directors and officers, the same men who have directed the Frontier Telephone Company and the Inter-Ocean Telephone and Telegraph Company.

Speaking of this change, B. G. Hubbell, president of the corporation, stated that there are many reasons why this plan will work to the benefit of the present stockholders and bondholders of the corporation and the public at large.

"These two companies," he added, "were organized about six years ago—the Frontier Telephone Company to do business in the city of Buffalo, and the Inter-Ocean Telephone and Telegraph Company to take care of the long distance business through the state of New York.

"The support of these Independent organizations by the general public has been such as to outstrip the wildest imaginations of their organizers, and they are found today with a capitalization entirely inadequate to take care of the demands made upon them for service. It has therefore been necessary to organize a new corporation, with greater financial resources, to keep pace with the business offered us.

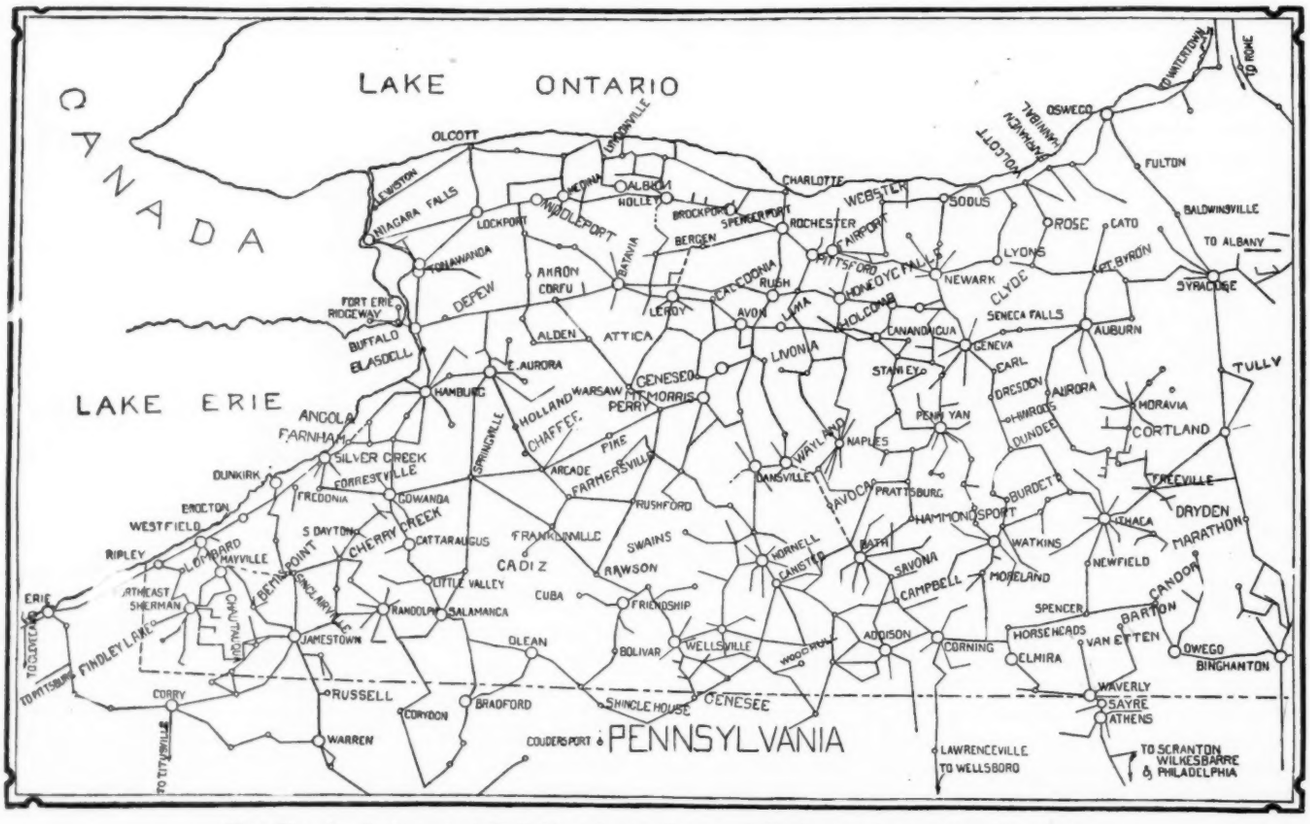
"When it was decided this must be done, it was felt there would be great strength in combining these various companies into one controlling operating organization, so the same authority which directs the affairs of the properties in Buffalo would direct the affairs of the properties throughout the state.

"There will ultimately be embraced in the Federal Telephone and Telegraph Company in the neighborhood of 80 different telephone companies, which practically control the Independent telephone business of central and western New York, and connect the telephone public of Buffalo with more than 100,000 subscribers in this section.

"These systems have been developed during the past six to seven years, by each little community having its separate organization, developed largely by the prominent people in these communities. Today, after an investment of more than $15,000,000, covering a construction period of six to eight years, the Independent companies of New York state have placed more than 175,000 telephones in service; have given the cities more than double the subscribers they enjoyed before competition; have given the small towns complete service—in many cases 10 times as many subscribers as before competition; have placed good commercial telephone service within the reach of nearly every farmer, and in this way have added materially to the convenience and prosperity of the citizens of New York state and have saved them millions of dollars. In Buffalo alone, the Frontier telephone system is used by the public to the extent of more than 50,000,000 messages annually.

"The new Federal Telephone and Telegraph Company will occupy territory in New York state covering about 30,000 square miles, with about 17,000 subscribers in Buffalo, and reaching 100,000 subscribers outside of that city over about 2,000 miles of well-built toll lines, carrying nearly 40,000 miles of heavy copper wire.

"The company will have a very successful and remunerative business already made for it, and a demand for its service which will tax its capacity to supply. I believe it has a very successful financial future before it."



Map Showing Independent Toll Line Connections and Exchanges in Western New York.

Indianapolis Telephone Company Wins Victory—Judge Parr Denies Petition of State Prosecutor and Upholds Validity of the Lease.

Judge Walter H. Parr, of the Boone County Circuit Court, handed down his decision on demurrer to the complaint of the State against the Indianapolis Telephone Company on January 4. His ruling was against the prosecutor's contention on every point, and sustained the demurrer of the Indianapolis and New Telephone companies to the petition filed by Prosecutor Hooton, assisted by an array of attorneys in the employ of the Central Union Telephone Company. The suit had its origin in the application of the Indianapolis Telephone Company, lessor of the New Telephone Company, to the Board of Public Works for a modified franchise permitting a slight advance in rates. This franchise was granted by the board and is now pending before the city council. The application for a modified franchise aroused bitter opposition on the part of the anti-city administration people and Prosecutor Hooton was urged to bring an action in the name of the State to restrain the Indianapolis and the New Telephone companies from entering into a new franchise with the city on the ground that the New Telephone Company had exceeded its chartered and statutory rights by leasing its plant to the Indianapolis Telephone Company.

The cause first came up before Judge Allen of the Marion County Circuit Court in Indianapolis, who compelled Prosecutor Hooton to admit that the half dozen associate counsel were in the employ of the Central Union Telephone Company; that they had prepared the papers in the case and that they were in the case by his permission. A change of venue was taken from Marion County, and Judge Allen sent the case to Hendricks County. From this county the State took a change of venue to Boone County, with the result that Judge Parr sustained the demurrer to the complaint, stating that there were but three points of importance at issue.

First—That such an injunction as prayed for, if issued, would indirectly prevent the common council of the city of Indianapolis from entering into the discussion and the passage of ordinances, and in such case, he held a court of equity has no right to interfere by injunction with the legitimate and discriminatory functions and powers of the city council.

Second—On the demand for the forfeiture of the company's charter he held that before such an extreme measure of relief would be granted it would be necessary to show that the public had been materially injured by the misuse or abuse of the powers granted to the New and the Indianapolis Telephone companies by the State. He held that the information did not show that the public had been materially injured.

Third—The third point raised the question of the validity of the lease of the New Telephone Company's plant to the Indianapolis Telephone Company. It was shown by the answer to the complaint that the New Telephone Company was restricted as to its capital by its charter, and in order to construct a plant of greater capacity to take care of the rapidly increasing business it became necessary to organize a new company with a wider latitude as to its capitalization. The lease in question, which the New Telephone Company made to the Indianapolis Telephone Company involved a construction of the amended telephone act of 1901. Judge Parr ruled that section 8 of said act, when construed with all the telephone acts of which it is a part, confers on the telephone companies the power to become the lessors or lessees of telephone lines, exchanges, plants or systems of other companies.

He further held that the act also confers powers on telephone companies to become lessees and accept such leases and to connect with other telephone lines and properties. Hence, the lease of the New Telephone Company to the Indianapolis Telephone Company was valid and the demurrer to this and other points are sustained.

This decision is of vital importance to the Independent telephone companies of Indiana. The decision settles the mooted question of the right of one telephone company to lease its property to another when the two are not in competition. The Eel River Railroad case was cited, but it was shown that the two cases were dissimilar. The court denied the right of a railroad to lease its property to a parallel road. Both had operating systems. In the present telephone case there were no parallel lines and no competing plant.

This celebrated case has been stoutly contested. The argument on demurrer before Judge Parr covered three days and some of the best attorneys in the state were engaged in the case.

The attorneys for the State and Bell company gave notice that they would file an amended complaint. This will also be met with a demurrer, which will very likely be sustained and then nothing remains to be done but an appeal to the Supreme Court, which few believe will be taken.

It is now expected that the Indianapolis council will ratify the modified franchise and it will not be long before the Indianapolis Telephone Company will be enjoying the fruits of its remarkable and deserved victory.

New Independent Toll Line Between Columbus and Indianapolis.

The United States Telephone Company expects to have its new Columbus-Indianapolis circuit in operation within a very few days. The company will then be able to handle all the Indianapolis business offered. The United States Company has also decided to put in a new circuit between Ashland and Crestline and two new circuits between Crestline and Mansfield. A committee has been named to consider improvements necessary to be made by the Cuyahoga and United States next year and to report to the board of directors.

Vermont and New Hampshire Independents to Meet at St. Johnsbury.

The annual convention of the Vermont and New Hampshire Independent Telephone Association will be held Jan. 12, at the Avenue House, St. Johnsbury, Vt. At this meeting it is probable that one of the principal topics of discussion will be the public utilities bill, now before the Vermont legislature, and believed to contain provisions injurious to the Independent companies. A full attendance is urged by the officers.

Telephone Saves House from Fire.

A dispatch from Bennington, Ky., states that a train set fire to a meadow two miles northwest of there, burning up hundreds of tons of hay, the country seat of ex-Senator Harry McMillan being saved from destruction by a force of men called by telephone.

Christmas in the Topeka Independent Exchange.

Operators of the Topeka Independent Telephone Company enjoyed an excellent Christmas dinner as the guests of the company. Men employes received very acceptable good-will offerings in the shape of cigars.

The Topeka Independent Telephone Company is one of the companies which believe that a higher grade of efficiency and loyalty is produced by creating in its employes the feeling that they are truly co-workers, and that their efforts to render good service and their loyalty are appreciated.

The Topeka Independent Telephone Company is closing

a very successful year, having approximately 6,700 subscribers, and has prospects of another very prosperous and busy year. This company is one of the Theodore Gary group, which in itself signifies success. Mr. W. P. Hemphill, who is general manager and treasurer, is starting a new scheme of organization, which, he believes, will produce one of the strongest, best and most loyal organizations in the Independent telephone field.

Illinois Tunnel Company's Chicago Franchise Extended.

Although the Illinois Tunnel Company has not arranged to comply with the terms of its franchise in the city of Chicago, the council committee on gas, oil, and electric light, on Dec. 22, voted concessions which put the situation in about the following form:

The Illinois Tunnel Company may have until February, 1911, instead of February, 1909, in which to install the 20,000 telephones required under the original ordinance.

The company may sell out to any concern it pleases at any time.

The company will not have to face a suit in court to defend its right to hold its franchise because of failure to live up to its agreement.

The company may refuse to allow an Independent or other telephone concern to enter Chicago by way of its wires and conduits.

And the following are the "concessions" the city gets from the tunnel company:

The company agrees to keep its books open for inspection by the city at any time.

The company agrees to keep the plant up to its present condition.

The company agrees to furnish a bond of $100,000 to live up to its agreements.

It is likely that these terms will be opposed vigorously when the report of the committee comes up for action.

Bell Rate Raising Brings Prospect of New Competition in Minnesota.

Interest in the telephone business in the territory occupied by the Minnesota Central Telephone Company, a Bell subsidiary, is absorbing much of the time of local business men. Although the company has presented figures purporting to show that it is losing money at the present rates, subscribers at Redwood Falls, a typical point, insist that they will organize a local company, and run the exchange themselves, or build a new one. The Redwood Falls *Reveille* recently published a response from Wm. G. Frank, treasurer of an Independent company at Springfield, Minn., to an inquiry concerning the results of its operation, of which letter the following is an abstract:

"We started in business March, 1905; at present we operate our local exchange with 184 telephones, of which 49 are business telephones at $2 per month, and 135 are residence telephones at $1 per month.

"Our local exchange stands us today $7,176.85. At the time when we started in business the Minnesota Central had something like 97 local telephones. About a year and a half ago they completely discontinued their exchange, and at present are only operating a booth in a hotel at this point. You, no doubt, are aware, that they threatened to put out of business every business man at the time we agitated a local exchange and rural lines. With that view in mind, they opened up a general store; also handled farm machinery and other articles in order to embarrass the local business men all they could, which, however, turned out disastrous for the Minnesota Central Telephone Company, as they ran the store only about one year, and my estimate is that they lost approximately $5,000 through operating the store.

"I am also reliably informed that the Minnesota Central Telephone Company is practically out of business as far as the rural exchange at New Ulm is concerned. I have been informed that they are willing to pull up their exchange, provided the Independent company at New Ulm will let them run their toll line into the Independent switch board.

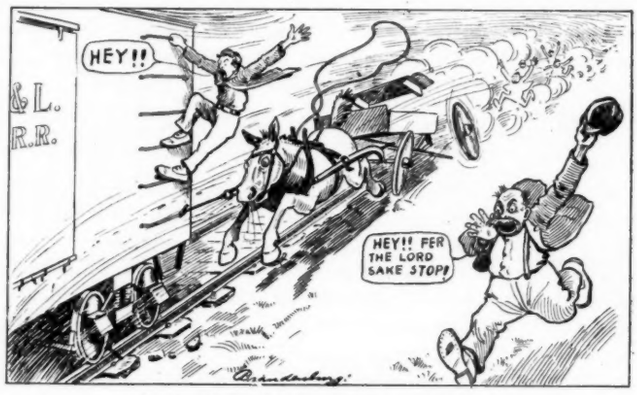
"We have annually paid a 10 per cent cash dividend, charging off all expenses of incorporating, stationery, and practically all we paid for tools, and credited to the reconstruction account $4,768.87. Our local exchange, independent from our rural lines, would net us between 30 and 33 per cent. Our total capital stock is $17,500. At this time we have no debts and have a cash balance in the bank of $950, and a certificate of deposit on interest of $600. Besides we have a carload of poles on hand, which are also paid for.

"The telephone company is in a splendid condition financially, and a local exchange without rural lines is without doubt one of the best investments our local people can get. Our shares of stock are $10 each, and no individual can hold more than $1,000 of its stock, thus placing the stock in reach of everybody.

"There is no reason in the world why your local business men should contribute a big dividend to any outside corporation and have local capital seek investment elsewhere at a nominal rate of interest."

A Good One on "Mont."

An Ohio correspondent reports that Mr. Mont George, superintendent of the Star Telephone Company, Ashland, Ohio, was recently out with a gang doing some line work, and hitched his horse and wagon to a freight car standing



An Incident of Construction in Ohio.

on a siding. A switch engine happened along and picked up the car, and the steed had quite an exciting run along the right-of-way, trying to keep up with the freight car before the crew got a signal to the engineer to stop.

Home Telephone Company to Make Big Improvements in Pasadena, Cal.

Improvements which will enlarge the plant sufficiently to meet the requirements of growth during the next five years will be made by the Home Telephone Company of Pasadena, Cal., during the next two months.

"We expect to put in nearly three miles of cable in various parts of the city," said William Eason, the president of the company. "From Fair Oaks avenue we expect to run a cable out Waverly Drive to Orange Grove avenue and down South Orange Grove avenue to California street and thence to Grand avenue and down to Huntington Terrace, even crossing the arroyo to San Rafael Heights, where we expect to see a wonderful growth within the next five years.

"The company is also to extend its lines out on the east side, giving greater service from this city to Lamanda Park and especially supplying the demand by residents in the northeast section of the city. A new cable, capable of accommodating 300 telephones, will be run through our con-

duits down Raymond avenue, where it will take the overhead wires to the east and northeast section of the city. Through this cable many of the telephones now on the old cable will have the advantage of the new, while the company will be in a position to meet the demand made upon it for several years to come."

The improvements will cost about $10,000.

Meeting of the Mississippi Independent Telephone Association.

Last week a meeting of the Mississippi Independent Telephone Association was held at Meridian, with President J. B. Shannon in the chair. At the business meeting it was determined that all traveling members should be supplied with applications for membership, and that they, while traveling over the state, should encourage all the Independent telephone operators to join the association and cooperate with each other.

Article nine of the constitution was changed to read: Any person, firm, company or corporation, as such, owning, operating, manufacturing or selling Independent telephone equipment shall be eligible to membership in this association upon an affirmative two-thirds vote of the members present at any regular or called meeting of the association, upon the payment of the membership fee.

A number of new names were presented for membership and the association voted and accepted such names as they thought were eligible to membership.

Mr. J. L. Peavy, of the People's Long Distance Telephone Company, gave a talk on the advisability of advertising the importance of all telephone companies being represented at these meetings, and stated that he thought it a good idea to have a paper printed putting forth the advantages of such an association and to let the telephone public know just what our object in having an organization is, and how it is beneficial to the members.

At the election of officers for the ensuing term, the following were chosen:

President, J. B. Shannon, New Albany, Miss.; vice-president, D. F. Eastman, Booneville, Miss.; secretary and treasurer, S. L. Pake, Tupelo, Miss. Executive committee—R. H. Polk, Memphis, Tenn.; J. L. Pitner, Ripley, Miss.; W. R. Hernstein, Memphis, Tenn., and J. W. Vaughn, Potts Camp, Miss.

At the afternoon session President J. B. Shannon gave an address listened to with keen attention. This was followed by a talk delivered by Mr. J. D. Tucker, representing the Home Telephone Company of Meridian, assuring the members that they had the hearty co-operation of his company and that Mr. J. O. Spotts, manager of the company, regretted that he could not attend the meeting.

Mr. N. D. Smith of the Mississippi Independent Telephone Company, Jackson, Miss., gave an interesting talk on the subject of "How to Finance a Telephone Company," giving his personal experiences at Jackson and those of other companies with which he had been connected. This proved an interesting subject to those present, all having questions to ask and have answered.

Mr. W. R. Herstein of the Electric Supply Co., of Memphis, next read a paper, "The Attitude of the Supply Company Toward the Independent Movement."

Mr. D. F. Eastman of the Booneville Telephone Company presented a paper, "On What Basis Should the Farm Line and the City Exchange be Connected?"

Mr. H. P. Dixon of the L. M. Ericsson Telephone Mfg. Company next read a paper on "Economy of Construction," which was very beneficial to the operating men.

Mr. W. W. Moore of the Wesco Supply Company, Birmingham, Ala., next gave the association a talk on things he thought would come up before the association from time to time. His suggestions were good and appreciated by all present.

At the evening session the methods of the common competitor in discriminating in order to get business, and run down the Independent telephone business, were taken up with a will, and every member present wanted to have something to say on the subject. The questions and answers on this subject came so fast that it is impossible to give an account of them. One member said: "If we could do all that was proposed at that session the Cumberland Telephone & Telegraph Company would be out of business in a few months."

The next meeting will be at Jackson, Miss., June 11. By that time the Independent people of that city expect to have the construction of their plant under way. It was decided to hold the next meeting during two days instead of one.

The secretary was authorized to find out by the next meeting just how many telephone companies are in the state, and other information.

A vote of thanks was extended to the Meridian Home Telephone Company for the courtesy shown the members of the association.

Southern Independent Telephone Association to Meet in February.

Announcement has been made by H. E. Parrish, chairman of the Executive Committee of the Southern Independent Telephone Association, Moultrie, Ga., that the next semi-annual convention of the Association will be held at Fitzgerald, Ga., instead of Dawson, Ga., as previously announced. The dates set for the meeting are February 23 and 24.

The announcement states that "the meeting will be an important one, and it behooves all Independent operators to join in the movement."

Independent Company at Liberty, Neb., Cuts Out Bell Lines to Save Independent Connections.

Some weeks ago the directors of the Liberty Independent Telephone Company, of Liberty, Neb., entered into a contract to connect with the Nebraska (Bell) company. The connection was made simply as a trial, but the Blue Springs Telephone Company, Independent, immediately cut the Liberty company out of its exchange. This greatly inconvenienced a large number of patrons of the latter company, who were unable to talk to Independent subscribers in Beatrice. At a recent stockholders meeting it was voted to cut out the Bell connection, on the promise that the Independent companies would renew their relations with their former associate.

New Demand for Competitive Service in Ontario.

Reports from Brampton, Ont., Canada, state that big public meetings have been held there to consider the organization of a telephone system, which will probably be operated by the municipality. On the committee which has been conducting this movement are Messrs. Elliot, Wilkinson, and South, well-known citizens of the place.

Maine Courts Fail to Grant First Application to Prevent Merger of Independent Company with Competitor.

On December 17, at Portland, Maine, Judge Peabody, of the State Supreme Court, denied an application to allow a minority stockholder and bondholder to intervene in the sale of the Northeastern Telephone Company to its competitor, the New England Telephone & Telegraph Company.

This action followed a denial by Judge Putnam, of the United States Circuit Court, in the forenoon of the same day, of a preliminary injunction restraining the New England Tele-

phone Company from taking over the property of the Northeastern Telephone Company. In the bill which was filed it was alleged that the New England Telephone Company had become possessed of the majority stock and bonds of the Northeastern Telephone Company, and had forced the Portland Trust Company as trustee under the mortgage to institute foreclosure proceedings under the mortgage before the state courts.

The bill sets out the fact that the foreclosure proceedings were begun and consummated by the sale of the Northeastern Telephone Company's assets to the New England Telephone Company for $275,000 and that it is the purpose of the New England Telephone and Telegraph Company to dismantle the plants of the Independent telephone company for the purpose of destroying competition. It is also set out that the Northeastern Telephone Company is doing an interstate business and that the New England Telephone & Telegraph Company designs to prevent all competition in this section of the country and for that purpose only has forced these proceedings. The bill seeks relief under the provisions of the Sherman anti-trust law alleging interference with interstate trade and an attempt to bring about the organization of a trust. In this bill the history of the Bell Telephone Company, as it is generally called, is set out from its organization and incidents are given where it is alleged it has sought to destroy all competition in this way.

Judge Putnam said that he would not issue the restraining order asked for, but that he would issue an order for the defendant company to show cause why an injunction should not be issued and he instructed such an entry to be made. But the court reserved the question of jurisdiction in this matter and especially provided that the order for the hearing of the petition for the injunction should not be construed to mean any restraint of the defendant companies.

At the suggestion of the court, the attorneys drew up a new petition covering these points and the court ordered service to made on the New England Telephone Company's officials, on the receiver of the Northeastern Telephone Company and the special master of the state court who was conducting the sale and also service to be made on the executive officers of the American Telephone and Telegraph Company at New York.

The attorneys for Mr. True and for the Independent telephone interests have instructions to press this case to the limit and to bring about some action which will prevent the consummation of the sale of the Northeastern Telephone Company.

Cuyahoga Report for November.

Following are comparative figures for November, 1908, showing improvement in the condition of the Cuyahoga Telephone Company, Cleveland, Ohio, as compared with the corresponding month of the previous year:

	Nov., 1908.	Nov., 1907.
Gross earnings	$68,845.26	$67,079.25
Total expenses	30,189.64	33,017.54
Net earnings	38,655.62	34,061.71
Interest on bonds	11,283.33	11,250.00
Surplus	27,372.29	22,811.71
DEDUCTIONS.		
Dividend on preferred stock	7,186.75	7,186.75
Reserve for depreciation	3,115.60	2,655.26
Total deductions	10,302.35	9,842.01
Surplus	17,069.94	12,969.70

Independent Telephone Service Established in Kalamazoo, Mich.

The Kalamazoo Home Telephone Company, during the last week of December, completed the installation of its system. During that week a switchboard and telephones were installed, cables drawn into the underground conduits, and wires and cables strung on poles. A number of subscribers' contracts were signed, and service was given over the system before January 1.

Unusually rapid work of installing this system was necessary owing to a new state law which was effective January 1. This law requires all telephone companies not actually giving local service, to obtain a city franchise through the voters of the city. It is necessary to obtain the consent of 60 per cent of the voters in order to make a franchise valid under the new law.

The service of the opposition telephone company is said to be very poor, as there are a number of Blake transmitters still in use, and high rates of rental are charged.

The citizens are well pleased with the new telephone service, although at the present time it is limited in extent. It is expected that the company will have between four and five thousand telephones in service by Fall. The rental rates will be fixed by a sliding scale, there being an increase provided for each addition of one thousand telephones connected to the exchange.

The new company will be well supplied with facilities for long distance telephone service, as heavy copper circuits extend in almost every direction from Kalamazoo.

Mr. LeRoy W. Stanton, consulting engineer of Cleveland, Ohio, is the leading spirit in developing the Kalamazoo system, as he secured the franchise and interested Eastern capitalists in the company.

Jacksonville Business Men Likely to Stand for Increased Telephone Rates.

A correspondent of TELEPHONY at Jacksonville, Fla., reports that the recent increase in rates, subsequent to the elimination of a prospect of competition, is likely to be borne without organized protest. Mr. H. H. Richardson, secretary of the Board of Trade, said that the Board of Trade would not take any action in the matter until a question is formally brought to its attention by complaint from members, etc. It is, therefore, impossible to say what action the board will take until it comes before them in proper shape.

The newspapers in the city have taken no part in any discussion which may have arisen privately. And, accordingly, lacking any general public action, it is likely that Jacksonville will make no organized protest.

Iowa Association's President Talks on Discriminatory Charges.

Mr. J. H. Shoemaker, president of the Iowa Independent Telephone Association, is reported to have talked to a Des Moines newspaper man, in a recent interview, as follows:

"It is coming to be recognized that a corporation cannot expect to be exempt from full responsibility for its act if it destroys the property of another corporation or individual. The plea that the property destroyed belongs to an enemy will not be accepted much longer in extenuation of, or as an explanation for the destruction of property, and it is coming to be recognized also that the sort of discrimination which charges double for a commodity or service in one locality, while delivering a similar commodity or service in another locality at less than cost, or free, 'as a war measure' constitutes a destruction of property, and tends to raise the total cost that must be paid by the public, upon the same principle, or to the same extent, as the destruction by fire does to raise insurance rates."

Keystone November Report.

November, 1908, earnings of the Keystone Telephone Company, of Philadelphia, show a net increase of $16,459, over the corresponding month of last year. Following is a statement showing comparative results in the respective months:

	1908.	Changes.
Gross earnings	$88,377	Inc. $ 257
Operating expenses and taxes	42,701	Dec. 5,379
Net earnings	$45,676	Inc. $ 5,636
From July 1 to Nov. 30:		
Gross earnings	$439,383	Inc. $ 2,103
Operating expenses and taxes	217,455	Dec. 14,356
Net earnings	$221,928	Inc. $16,459

Telephone Patents

Conducted by Max W. Zabel

TELEPHONE SYSTEM.

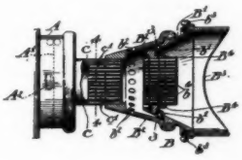
Alfred Dyson and Francis W. Dunbar, Chicago, Ill., patent 907,582, Dec. 22, 1908.

This patent relates to automatic telephone systems, and more particularly, to central energy automatic systems, and is used to cover a system provided with automatic switches at the exchange, having an electro-magnet which is adapted to control the disconnection of the subscriber's line when through talking, which relay is provided with a core having four energizing windings. Two of said windings are in circuit with the calling subscriber's line and the other two are in circuit with the called subscriber's line. A central source of current is in circuit with these windings, the disposition of the windings in circuit with each line being such that during conversation they neutralize one another with respect to the core of the electromagnet, independently of the windings in circuit with the other line. The apparatus at the substation, under control of the subscriber, is adapted to destroy the neutralizing effect of the windings in circuit with his line independently of the windings in circuit with the other line, and thereby to actuate the electromagnet. The electromagnet is adapted simultaneously to serve as a repeating coil.

DEVICE FOR TRANSMITTING SOUND WAVES.

Arthur Dare, Philadelphia, Pa., patent 907,320, Dec. 22, 1908.

The device shown in this patent is for transmitting sound waves into a transmitter for use in connection with a telephone phonograph, and other like sound transmitting instru-



ments. The invention embodies a device so constructed that when placed over the mouth, the sound of speech will be muffled, and rendered inaudible from without, yet, at the same time, the sound waves set up in the mouth-piece B^3 will be permitted to travel to the diaphragm contained in the casing A of the recording or transmitting instrument, released only from the pressure of exhaled air from the lungs. This is accomplished by the employment of the large mouth-piece having pressure exits B^4, which consists of the resonant tubes communicating with an expansion chamber B^2 of sufficient capacity to reduce the pressure and permit the air to pass out at the reduced pressure to the atmosphere.

The invention further contemplates the use of a double series of parallel, non-resonant tubes c^1, which may be adjusted to intensify the sound, and which serve to prevent a reflex action of the diaphragm on the receiving side of the instrument.

TELEPHONE HOLDER.

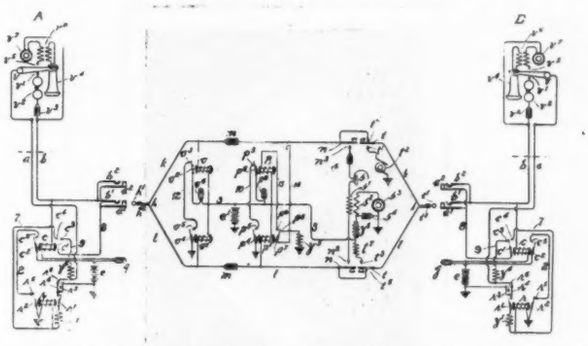
L. S. Hallowell, New York, N. Y., patent 906,874, Dec. 15, 1908.

A desk telephone arm is the subject matter of this patent, and consists of two hollow semi-circular tubes, which fit together and are arranged to slide one upon the other. One end of the combined tubes is provided with supports for the desk telephone and the other end is adapted for attachment to the desk. A centrally located spiral spring enclosed by the two halves of the tube, normally maintains the desk telephone, when placed on the bracket, in the position desired.

TELEPHONE SYSTEM.

Alfred H. Dyson, Chicago, Ill., patent 907,581, Dec. 22, 1908.

This invention covers a common battery switchboard and line circuit, and utilizes a two-wire connection between the subscriber's line and the spring jack. Cut-off relays, as shown in the illustration, are used in connection with non-inductive re-



sistances which prevent the short-circuiting of their respective circuits. It will be seen from the illustration that the circuit of the cut-off relay has two points of control, one controlled by the subscriber and the other controlled by the operator. It requires the co-operation of both subscriber and operator to secure the energization of the cut-off relay.

TELEPHONE DROP.

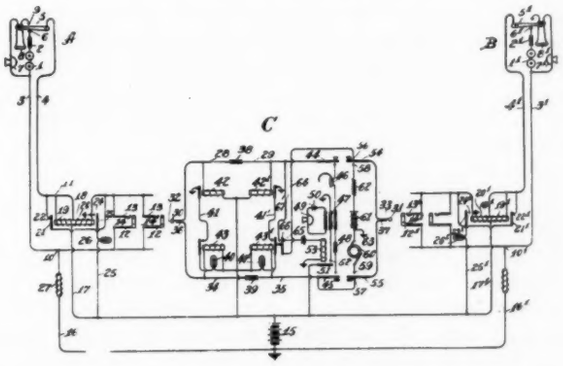
Tiodolf Lidberg, Chicago, Ill., patent 907,062, Dec. 15, 1908.

This patent describes a magneto drop which consists of a combination arrangement of a drop and jack in the well-known unit form. The arrangement of the drop is such that the drop coil is inserted from the front of the combined drop and jack, and has mounted on its core a shutter support to which the drop shutter can be readily attached. The armature and shutter latching devices are mounted to the rear of the drop shell, as is customary, and do not have to be displaced when the coil is removed.

TELEPHONE SYSTEM.

Harry G. Webster, Chicago, Ill., patent 907,660, Dec. 22, 1908.

This patent covers a common battery telephone system having a differental line and cut-off relay, 18, which is provided



with two windings, 19 and 20. The winding 19 is under the control of the subscriber to actuate the line lamp 26, and the winding 20 is under the control of the operator to efface the line signal. The arrangements are such that the winding 20 overpowers the winding 19. Further details will be apparent from the illustration.

In the Manufacturing Field

A New Conduit Company.

Mr. E. F. Kirkpatrick, who for nine years has been prominently identified with the clay conduit business has incorporated a company known as, The Kirkpatrick Conduit Company.

Mr. Kirkpatrick, or "Kirk" as he is familiarly known in the electrical trade, has acquired control of the output of the big clay conduit making plant at Grand Ledge, Michigan, and be-

Mr. E. F. Kirkpatrick.

gins business this year on his own account. The plant is of steel and brick construction, equipped with the most modern machinery known to the clay conduit manufacturing industry. It has a kiln output of several million feet annually, and is located upon many acres of a fine fire clay.

Through Mr. Kirkpatrick this plant was kept busy during 1908, and shipped 3,000,000 feet of conduit. Among the big users were the Chicago City Railway Company, Chicago Edison Company, Minneapolis Street Railway Company, City of Milwaukee, Detroit River Tunnel Company, City of Chicago, Northern Power Company, South Park Commissioners, Chicago, the U. S. Naval Training School, North Chicago, Butler Brothers-Hoff Company, Detroit, North Shore Telephone Company, Ludington, Mich., and several other large orders were also filled.

Twenty years of continuous service as a salesman in the electrical industry has made "Kirk" known to every man who has been prominently identified with the business and its kindred interests. He will have offices in the Western Union building, Chicago, where he will be pleased to see all his friends and acquaintances.

Chicago Electrical Show Prospects.

There is every reason to believe that Chicago's Fourth Annual Electrical Show, which occurs at the Coliseum from January 16 to 30, will be the most successful electrical trades display ever held in America. Forty thousand square feet of space have been sold and the exhibits as a whole will cover the entire field of electrical science, invention and industry. If there is anything under the sun that is new in electrical development and research that will not be shown at this exposition it will not be the fault of the management, because the country has been scoured from coast to coast with the idea of bringing together everything that would go towards making the show as a whole the most complete and representative that the trade has ever enjoyed.

One exhibit which will undoubtedly attract great attention will be that of the United States Navy, which will occupy the entire Coliseum annex and will show among other things the complete electrical equipment of a modern battleship. Neither the public, nor the electrical trade itself, full comprehends an electrical equipment of this character as a whole, but the simple fact that it costs in the vicinity of $400,000 to fully equip one of the great armored sea fighters of today gives some idea of the greatness and importance of an exhibit of this character.

During the show there will be several meetings and conventions of electrical tradesmen, the telephone men having two days the second week of the show—Tuesday and Wednesday, January 26 and 27. There will also be several special souvenir days, the management having arranged for the giving away of a number of attractive novelties. Weber's Band will also be employed throughout this year's show.

In the list of exhibitors for the 1909 show are the following companies selling telephone equipment: Wagner Electric Co.; National Battery Co.; Chicago Fuse Wire & Mfg. Co.; Electric Appliance Co.; The Stoltz Electrophone Co.; Stromberg-Carlson Telephone Mfg. Co.; Mathias Klein & Sons; Telephony Publishing Co.; Manhattan Electrical Supply Co.; Ft. Wayne Electric Works; Central Electric Co.; International Correspondence Schools; McRoy Clay Works; Appleton Electric Co.; Westinghouse Electric & Mfg. Co.; General Electric Co.; American Steel & Wire Co.; Swedish-American Telephone Co.; Jewell Electrical Instrument Co.; Roth Bros. Co.; H. W. Johns-Manville Co.; Red Cross Antiseptic Co.; Northern Electrical Mfg. Co.; A. W. Kratz; Electric Storage Battery Co.; Mears Ear Phone Co.; Electrical Testing Laboratories, and the National Carbon Co.

North Electric Company Appoints New Salesman.

Mr. A. T. Clark recently accepted a position as salesman with the North Electric Company. He makes Kansas City, Missouri, his headquarters, and is looking after the company's interests in Iowa and South Dakota.

Mr. Clark comes to the North Electric Company well

Mr. A. T. Clark.

equipped with the necessary knowledge and ability to make a successful salesman. He has been in the telephone field a number of years, and has a wide experience. In his early career in this business he was connected with the Michigan

Bell Telephone Company. Later he accepted a position with the Central Union Telephone Company, after which he was connected with the Sagatuc & Ganges Telephone Company, the Nebraska Telephone Company, the Iowa Telephone Company and the Northwestern Telephone Exchange Company. He later accepted a position with the Inter-State Supply Company of Sioux City, Iowa, where he remained until he went in business for himself in Nebraska in the operating field. Recently, seeing the opportunities with the North Electric Company, opened by the advent of their Automanual equipment, he accepted a position as salesman.

Lasting Qualities of White Cedar.

More than half a century has passed since some surveyor, or possibly an employe of the Hudson Bay Company, having a little idle time on his hands, squared off the butt of a cedar tree and carved thereon the words that prove the lasting qualities of white cedar.

The accompanying illustration is from a photograph of the butt of a white cedar post shipped to the H. E. Walker Lumber Company of Minneapolis, by the McCulloch & Moss Lumber Company of Minneapolis, Minn., who produce annually one hundred thousand white cedar poles and half a million posts. The post was in a consignment shipped by the latter concern from Lake County, Minn., on the north shore of Lake Superior. A small portion of the bark was removed in order to make more distinct the lettering of the date "Sept. 19th, 1857." Otherwise the post is just as it came from the woods. Although the words were carved in the wood more than fifty years ago, and the squared portion has been exposed to the weather all the time since then, the wood is as sound as it ever could have been.

Cedar Post Upon Which an Inscription Was Carved Over Fifty Years Ago and Which is Still Perfectly Sound.

A close examination of the portion of the post which has partly grown over the lettering shows the required number of rings to indicate the correctness of the date. The man who carved the words in the young tree has probably turned to dust, but nature has been more kind to the white cedar tree.

The post has been delivered to the Forestry Department of the University of Minnesota, where it will be kept to show to future generations.

THE CENTRAL ELECTRIC COMPANY, of Chicago, is distributing circulars describing cable splicing joints for use with lead cable work. It is claimed that the use of this joint permits a more flexible distribution system and will save money, not only on the first cost, but also on the maintenance cost of cables.

THE WARNER ELECTRIC COMPANY of Muncie, Ind., is sending out one of the most artistic calendars of the year.

Fireproof Furniture and Lockers.

Under the title of "General information on what we make," the General Fireproofing Company of Youngstown, Ohio, has issued a very attractive booklet. The part which is especially of interest to telephone companies is that which describes the "Allsteel" furniture and filing devices. The desks and filing cabinets are made of steel with an oak or mahogany finish. In addition to being fireproof, the furniture is sanitary, vermin proof and durable. It is not affected by atmospheric conditions and hence no trouble is experienced through "binding" of the drawers in the desks and filing cases.

The "Allsteel" locker is made in a number of different types, both from expanded metal and sheet steel and is finding much favor in the eyes of progressive telephone managers.

THE AMERICAN CARBON & BATTERY COMPANY, East St. Louis, Ill., is mailing to its customers attractive calendars for the year 1909. This firm manufactures a well known line of dry batteries which have been extensively used by telephone companies.

THE AMERICAN ELECTRIC FUSE COMPANY, Muskegon, Mich., makes strong claims for the safety of the "American" enclosed fuse, for the reason that the length of wire is three times that of the enclosing tube, due to the special method of manufacture. This fuse will be exhibited at the Electrical Show at the Coliseum, Chicago, January 16 to 30, together with a complete line of other well-known protective equipment made by the American Company.

THE L. M. ERICSSON TELEPHONE MANUFACTURING COMPANY, Buffalo, N. Y., has just closed a contract with the Plattsmouth Telephone Company, for Elmwood, Neb., for two sections type "D" switchboards to be equipped with the new Ericsson No. 6 automatic drop and jack. These sections are practically duplicates of the ones recently delivered to the Plattsmouth Telephone Company for its Havelock exchange.

THE MCROY CLAY WORKS, Brazil, Ind., is sending out New Year blotters bearing the following sentiment: "Whatever the past year may have meant for you, make it dead history. But let the new year be a living issue. With a big, fresh sponge, dripping with the clear water of forgiveness, wipe clean the slate of your heart. Enter the year with a kind thought for every one." This looks like a good thing to keep on the desk for a while.

THE CINCINNATI TOOL COMPANY, Cincinnati, Ohio, has issued an attractive catalogue of all types of mechanics' tools of the Hargrave quality.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. O. H. DORSEE of Harrisonville, Mo., has been assigned to the management of the Home Telephone Company at Iola, Kan.

MR. J. P. McCUTCHEON of Pierce City, Kan., has taken charge of the Columbus, Kan., office of the Galena Telephone Company.

MR. E. L. DEXTER of Fond du Lac, Wis., has been promoted the managership of the Horicon exchange of the Wisconsin Telephone Company.

NEW COMPANIES.

PELL CITY, ALA.—The St. Clair County Telephone Company has been incorporated with $10,000 capital stock by L. Cooke, J. F. Cooke, E. E. Cooke and others.

POCAHONTAS, ARK.—The stockholders of the Farmers' Mutual Telephone Association of Pocahontas have decided to incorporate the association. H. M. Crockett, James Fry, J. R. Holt, Dr. W. Wilson and J. L. Johnson were appointed a committee to prepare the incorporation papers and file them with the secretary of state.

GROVER, COL.—Grover and vicinity is to have a rural telephone system that is contemplated to reach out in every direction from this place and take in all the farms between Greeley and Grover and also secure connection with Cheyenne and Sterling if possible. The initial step was taken recently when the Grover Telephone Company was organized and application made for articles of incorporation. The company was organized with E. E. Lewis as president, G. E. Morris secretary-treasurer and A. B. Milton, D. M. Hawley, George W. Parker, E. E. Lewis and G. E. Morris as a board of directors. It is proposed to organize a stock company with a capital stock of $500, that is all paid in and may be increased at any time by a vote of the stockholders.

TELLURIDE, COL.—The Naturita Telephone Company, which proposes building lines through Montrose and San Miguel counties, has been incorporated with a capital of $50,000. The principal offices are to be at Coventry. The incorporators are G. A. Akers, H. H. Ross, Henry Pamm, George M. Hook and Arthur Priestley.

INDIANAPOLIS, IND.—The Paxton Telephone Company of Sullivan has recently been incorporated with a capital of $500. The incorporators are Jacob Cox, John M. Cammon and John Nesbit.

THOMPSON, IA.—A company of Thompson business men have organized what will be known as the Thompson Telephone Company, and have purchased the local telephone exchange recently purchased of J. A. Peters and associates by W. A. Eckles of Nora Springs.

PARSONS, KAN.—A new rural telephone company was recently organized by some of the farmers south of this city. The company will be known as "Thompson Line No. 2," and the officers are: J. E. Pefley, president; J. O. Benard, vice-president; L. J. Bicknell, secretary; A. A. Johnston, treasurer; D. H. Pefley, W. F. Thompson and Mr. Gruell, board of directors.

BARRYTON, MICH.—The Barryton Rural Telephone Company has filed articles of incorporation. It was organized in April, 1907, and is capitalized at $10,000. The directors are Henry Walroth, D. Wait and Chas. Gawner.

LANSING, MICH.—Articles of incorporation have been filed by the Smyrna Telephone Company, with a capital stock of $3,000. The directors are Guy Purdy, Charles H. Mead, George B. Frost and Carl N. Northrop.

PLEASANTON, MICH.—At a recent meeting of the citizens of District No. 5, Pleasanton, a rural telephone company was formed to be affiliated with the Benzie County Telephone Company. The new line will be known as the A. B. Citizens' Line of South East Pleasanton. The following officers were elected for the ensuing year: President, R. Norconk; vice-president, Wm. Norconk; secretary, Jones D. Babcock; treasurer, Geo. O. Hadley. Directors, Jay Babcock, Wm. D. Gillespie and Walton Babcock.

RIGA, MICH.—Articles of incorporation have been filed by the Riga Farmers' Telephone Company with a capital stock of $3,000.

DEXTER, MINN.—The Dexter Telephone Company has been incorporated with a capital stock of $10,000.

JACKSON, MISS.—The Plattsburg Telephone Company of Plattsburg, Winston county, has filed articles of incorporation. The capital stock is placed at $5,000 and the incorporators are J. L. Yardborough, J. C. Hobby and others.

JEFFERSON CITY, MO.—Secretary of State Swanger has issued a certificate of incorporation to the Butler, Peru and Pleasant Gap Telephone Company of Butler with a capital stock of $5,000. The line is to extend throughout Bates county. J. I. Bartlett, N. Blogh, C. M. Thomas, U. S. Isom and R. R. Eason are the directors.

ST. LOUIS, MO.—A telephone company has been formed to operate and maintain telephone lines in Lebanon. It is known as the Laclede County Telephone Company and has a capital stock of $10,000. The incorporators are: J. E. Dickens, B. C. Hooper, Thos. Gilmer, Martin D. Johnson, and others.

HELENA, MONT.—Articles of incorporation of the Independent Messenger and Telephone Company of Butte have been filed with Secretary Yoder by F. W. Graff and others. The capital stock of the company is $10,000.

AINSLEY, NEB.—The Box Elder Telephone Company of Ainsley has been chartered with a capital stock of $25,000 by E. B. Wait, H. Springman and others.

ALBANY, N. Y.—The Federal Telephone & Telegraph Company, capital $6,000,000, with principal office in Buffalo, has filed a certificate of incorporation with the secretary of state. The company states that it proposes to operate telephone and telegraph lines in the principal cities, towns and villages in the western part of the state. The directors are: B. G. Hubbell, W. H. Andrews, C. C. Machemer, R. W. Chapin, G. A. Plimton, H. H. Lyttell, R. R. Hefferd, Andrew Langdon, T. B. Lockwood, C. W. Goodyear, A. D. Bissell, C. L. Ingham, W. P. Cooke, all of Buffalo, and G. D. Morgan, Rochester.

BISMARCK, N. D.—A charter has been issued to the Avon, Pleasant View Telephone Company of Northwood, which has a capital stock of $25,000. The incorporators are: T. O. Mandt, E. Corkins, John Pietron and others, all of Northwood, N. D.

CINCINNATI, OHIO.—The Davis Telephone Company of Whitley county has filed articles of incorporation with a capital stock of $1,000. The incorporators are: A. B. Johnston, M. A. Maurey, W. B. Davis, and others.

COLUMBUS, OHIO.—The Arthur Mutual Telephone Company of Arthur, Paulding county, has been incorporated by Claude Morris and others.

COLUMBUS, OHIO.—The Hopedale Telephone Company of Hopedale has been incorporated by W. V. Scott, J. K. Skeely, J. B. Beadle and others with a capital of $5,000.

PAWNEE, OKLA.—The Coal Creek Telephone Company has been chartered with a capital of $300 by W. J. Nail, John Wolfe and J. M. McKill.

PRYOR CREEK, OKLA.—A rural telephone company was organized here recently with the following officers: C. L. Samuel, president; O. H. Graves, vice-president; J. O. Robinson, secretary and treasurer. The purpose of this company is to build rural lines in the county and put every farmer in Mayes county in touch with the county seat and the local market.

READING, PA.—A new rural telephone line has been developed, which will take in the entire southeastern portion of Lebanon county and part of Berks. The organization will be known as the Shaeffertown Rural Telephone Company, and has the following officers: President, F. B. Horst, Reistville; vice-president, J. T. Gable, Horst Mill; secretary, Alvin Schaeffer, Schaefferstown; treasurer, S. H. Bomberger, Schaefferstown. Directors, Nathan F. Kroll, H. H. Bomberger, Irvin Horst, John H. Kreider and A. S. Brendie, all of Schaefferstown. The capital stock is $5,000.

DALLAS, S. D.—The Tripp-Myer Telephone Company has been incorporated with a capital stock of $10,000.

HUSUM, WASH.—A new organization, the Farmers' Union Telephone Company, has been established for the benefit of rural district residents of Klickitat county, with headquarters at Goldendale. Several of the leading business houses of that city have installed telephones of the new system, and it is predicted the line will do a good business. It is the intention of the company to unite all farmers' lines and operate them upon an actual cost basis. The farmers are expected to build and operate their own lines and pay a pro rata of switchboard expense, which will be reduced as the system grows.

SEATTLE, WASH.—The Skagit River Telegraph & Telephone Company of Baker, Skagit county, has been incorporated with a capital stock of $10,000 by J. C. Eden and R. J. Kellogg.

WENATCHEE, WASH.—A meeting was held by the Southside ranchers recently for the purpose of discussing the extension of the telephone service from Wenatchee into that territory and thus be connected with both Wenatchee and Waterville. The plan is to make a stock company of the system, and A. P. Kiser was elected president; Eli Ball, vice-president; Dave Packard, secretary, and John Doneen, treasurer.

CONCORD, W. VA.—The Capon Telephone Company has been incorporated by G. K. Kump and others.

FAIRMONT, W. VA.—A charter has been issued to the National Telephone Company, of Monongalia county. This is the new company, formed by the officers of three Independent lines of the state which bought the People's plant at Morgantown. The capital stock is $50,000. The principal offices will be in Fairmont, and the incorporators are W. C. Handlan and S. W. Harper, of Wheeling; C. E. Manley, J. Walter Barnes and E. F. Hartley, of Fairmont.

MADISON, WIS.—The Farmers' Telephone Company, town of Clyde, Iowa county, has been incorporated with a capital of $400. The incorporators are: George Gilbertson, James E. Moore and Frank Baker.

MILWAUKEE, WIS.—The Sawyer and Western Telephone Company of Sturgeon Bay was recently incorporated with a capital of $600. The incorporators are: Christopher Hanson, John A. May and George O. Whitford.

MOUNT FOREST, ONT., CAN.—The Mount Forest, Wellington and Grey Telephone Company has been incorporated with a capital of $10,000. The provisional directors are: R. O. Kilgour, J. J. Cook, Mount Forest, and W. H. Wallace, Egrement Township.

THORNDALE, ONT., CAN.—The East Middlesex Telephone Company has been incorporated here with a capital of $30,000. The provisional directors are: R. L. Guest, London Township; R. T. Wright, F. W. Hughes, Thorndale, Ont.

TORONTO, ONT., CAN.—The Malahide and Bayham Telephone Co-Operative Association of Richmond, Ont., has been chartered with a capital stock of $10,000.

FINANCIAL.

CHICAGO, ILL.—The Effingham County Telephone Company of Altamont has increased its capital stock from $8,000 to $10,000.

PROPHETSTOWN, ILL.—The Prophetstown Mutual Telephone Company has increased its capital stock from $6,500 to $10,000.

LEESBURG, IND.—The Public Service Telephone Company has declared a dividend of $1.15 per share. This is at a rate of 7 per cent per annum.

DES MOINES, IOWA.—Amended articles of incorporation have been filed by the Mississippi Valley Telephone Company, in which the capital stock is increased to $50,000. The principal place of business is Keokuk, and the lines extend from that city.

MIDDLESBORO, KY.—The Middlesboro Home Telephone Company has increased its capital stock from $15,000 to $25,000.

ST. LOUIS, MO.—The regular quarterly dividend of 1¼ per cent, payable Feb. 15 next, has been declared by the board of directors of the Kinloch Long Distance Telephone Company. The company is capitalized at $2,800,000, and $350,000 is required to pay the dividend. The last dividend was paid in September, in bonds. The present dividend is in cash.

ST. LOUIS, MO.—The Senath Telephone Company of Senath has filed a statement that it has made an increase in its capital stock from $6,000 to $20,000.

ST. LOUIS, MO.—The Del Rio and Western Telephone Company has increased its capital stock from $20,000 to $60,000.

FRANCHISES.

SISSETON, S. D.—A new telephone company has been granted a franchise to operate in this place.

CONSTRUCTION.

WALLACEBURG, ARK.—A rural telephone line is being constructed which will connect a large part of the county to the south and east with this place.

RIALTO, CAL.—A common battery telephone system will be installed in Rialto the first of the year. All the old leads will be taken down and replaced by new ones.

SACRAMENTO, CAL.—The line of the Glenn County Telephone Company, to connect with the wires of the Colusa Independent company, will be the first construction work to be done by the local company. Poles have been distributed, and Glenn county will soon have a new telephone company, one equipped with up to date apparatus.

EARLVILLE, ILL.—A switchboard with a capacity of 300 lines has just been installed in the local exchange of the Northern Illinois Telephone Company.

GLASFORD, ILL.—The Glasford and Harkers Corners Telephone Company will rebuild its line.

MONMOUTH, ILL.—The Monmouth Telephone Company will enlarge and extend its plant and system in this city. It is likely that a new exchange building will be erected.

QUINCY, ILL.—The Mississippi Valley Telephone Company has completed its new copper line as far as Quincy, which gives it connection with Quincy, Jacksonville, Springfield, Decatur, Alton, Hannibal and the adjoining towns, St. Louis and other towns in Missouri.

GREENSBURG, IND.—The Decatur County Independent Telephone Company has decided to install new power equipment in a building separate from the exchange. The plant will be equipped with modern machinery including an eight horse power gas engine.

SOUTH BEND, IND.—Theodore Thornward, president of the South Bend Home Telephone Company, announces that $30,000 will be spent in improvements to the plant during the coming year.

WAVERLY, IA.—The Corn Belt Telephone Company will rebuild its lines and install new equipment in the exchange in the spring.

CARBONDALE, KAN.—At a recent meeting of the stockholders of the Carbondale Telephone Company a 150-drop switchboard was ordered.

GARDEN CITY, KAN.—Plans for the establishment of a telephone line between Garden City and Scott City are being considered by Manager Marsh and Manager Newsom, and it is likely that connection will be made within a short time.

HORTON, KAN.—The Kansas Independent Long Distance Telephone Company has awarded a contract for 2,500 telephone poles and 2,500 cross arms.

MINDEN, KAN.—Work has been started on the Glendale rural telephone line. Connection will be made with the exchange at Nashville.

NASHVILLE, KAN.—A new farmers' telephone line, to be known as the Glendale line, is being constructed to connect Nashville with the country northwest. It will be 14 miles long.

WASHINGTON, KAN.—The Washington Telephone Company is installing a new switchboard, adding new cables and making other improvements in its system.

GRAND CANE, LA.—J H. St. Clair & Son, of Downing, Mo., will construct a telephone plant at Grand Cane.

GRAND RAPIDS, MICH.—The Citizens' Telephone Company's new south end station on Cass avenue and Hall street, is nearly completed, and it is expected will be ready for occupancy early in January. It is of brick, one story high and fireproof construction. It is probable that an east end station will be built the coming year to better care for the heavy business in that section.

SUMMIT, MICH.—The United Home Telephone Company is making repairs and reconstructing its lines all over the country, having numerous gangs of men at work, who are working as rapidly as weather and other conditions will allow.

BELLE PLAINE, MINN.—President Widmer, of the local telephone company, states that it is planning great extensions to the rural line next spring.

FAIR HAVEN, MINN.—The Annandale Telephone Company has extended its line into Fair Haven.

AURORA, MO.—The Mutual Telephone Company has just finished its line from the east, connecting at Crane. The line has connection with Mt. Vernon, Stotts City, Hoberg, Verona, Marionville, McKinley, Crane, Osa, and Cassville.

BOONVILLE, MO.—R. Lotspeich, manager of the Pilot Grove Independent Telephone Company, has connected his line with the Independent system at Boonville, giving Pilot Grove direct communication with the county seat. Now that this work has been completed Mr. Lotspeich will extend his line direct to Bunceton by the way of New Lebanon. The Pilot Grove Independent Telephone Company is pushing its telephone lines into territory that has heretofore been neglected.

HOPKINS, MO.—At the meeting of the directors of the Mutual Telephone Company it was decided to install another switchboard in Hopkins.

WINDSOR, MO.—The Missouri Union Telephone Company has just finished the rebuilding of the Windsor exchange. An entire new switchboard was installed. Over 6,000 feet of new cable was added, making a total of 9,500 feet of cable in the Windsor exchange.

SAYVILLE, L. I., N. Y.—The double wire system is now complete along Great South Beach of the Long Island coast, and long distance telephone connection is established direct with each life-saving station, doing away with transmission of messages from station to station.

DILLSBORO, N. C.—Joseph J Hooker of Dillsboro and Webster, N. C., will rebuild the telephone line from Dillsboro to Webster and Dillsboro to Harris Mine, N. C.

PORTSMOUTH, OHIO.—There is a movement on foot among the farmers looking toward the organization of a Farmers' Independent Telephone Company. The proposed line would run from Harrisonville to Portsmouth.

CONNELLSVILLE, PA.—For the purpose of giving more efficient local service the Tri-State Telephone Company has installed a district board in the exchange office here. This board will handle all calls outside of Connellsville but in this district of the American Union Telephone Company.

EASTON, PA.—The new telephone company is erecting a line between Washington and Changewater.

POTTSVILLE, PA.—The American Union Telephone Company is replacing its open wires in this place with cables.

GREENWOOD, S. C.—The Sumter Telephone Manufacturing Company has just completed a 1,500-line switchboard for the Greenwood exchange. It is a common battery board and is equipped with 1,000 lines.

SISSETON, S. D.—The Effington Telephone Company is extending a new line through Grant township.

EMPORIA, VA.—The Greenesville Water Power Company, W. Samuel Goodwyn, president, will take over the local telephone system and will rebuild it.

STEPTOE, WASH.—The members of the telephone company owning farmers' line No. 3, have decided to reconstruct the line, putting in high poles with a return wire.

BRISTOL (KENOSHA CO.) WIS.—The Bristol Telephone Company has practically decided to spend $5,000 in extensions and general improvements on its lines in Kenosha county.

COON VALLEY, WIS.—The Coon Valley Farmers' Telephone Company has started the construction of its new line to North Ridge. In the spring the company expects to construct many extensions and several branch lines.

UTICA, WIS.—The Utica Telephone Company has extended its lines about three miles east of Pickett and three miles east of Fisk. The company plans to make greater improvements in the spring.

LANDER, WYO.—The Independent telephone line from this place to Kemmerer, via Newfolk, Pinedale, Boulder, Big Piney, Daniel and South Pass, has been completed.

BIRTLE, MAN., CAN.—The municipal telephone committee has ordered instruments for a local telephone system and a line is now being built to Solsgirth and farmers will be connected en route.

TORONTO, ONT., CAN.—The new telephone line between Toronto and Cobalt has been completed and opened for business.

ESTEVAN, SASK., CAN.—A rural telephone company is being formed to build a telephone line from here to Ambrose and Hamar. H. Yardley is one of those interested in the project.

KILLAM, SASK,, CAN.—A telephone line will be built from here to the district south of town. J. A. Neely has charge of the work.

ROSTHERN, SASK., CAN.—Work has been completed in stringing the wire for the government telephone line from this place to Duck Lake.

ELECTIONS.

PROPHETSTOWN, ILL.—The following officers were elected at the recent annual meeting of the Prophetstown Mutual Telephone Company: President, M. F. Hill; vice-president, George Seyller; secretary, H. G. Hotchkiss; treasurer, O. P. Petty.

FORT WAYNE, IND.—At the annual meeting of the stockholders of the Home Telephone Company, of this city, the following officers were elected: President, Charles S. Bash; vice-president, J. B. Reuss; secretary, Wm. L. Moellering; treasurer, M. B. Fisher. Board of directors, Isadore Lehman, W. A. Bohn, G. M. Hoffman, P. B. Smith, August Becker and A. E. C. Peterson.

BONAPARTE, IA.—The Farmers' Connective Telephone Company, at its annual meeting elected the following officers and directors: Lee Bradford, president; David Hornbaker, secretary; M. F. Hornbaker, treasurer; George Walters, A. J. Cummings, Charles Sadler and Ralph Story, directors.

WHITTIER, IA.—The Whittier & Northwestern Telephone Company at its annual meeting elected Dilwyn Hampton, president; O. D. Comer, secretary; Eugene Smith, T. A. Clanton and O. A. Richwine are the directors of the company.

HOLTON, KAN.—The telephone line No. 39, at a recent meeting, elected John Bryant, president; E. L. Parkhurst, secretary, and Chas. Enouft, treasurer.

REXFORD, KAN.—The officers of the Rexford Mutual Telephone Association for the coming year are: E. B. Bastin, president; A. W. Christian, secretary, and A. A. Buschow, treasurer.

SPENCERPORT, N. Y.—The directors of the Ogden Telephone Company have elected Frank C. Blackford of Adams Basin president; Horatio D. Burritt, of Ogden, vice-president, and H. Arthur Nichols, of this village, secretary-treasurer.

BUXTON, N. D.—The officers of the Red River Valley Telephone Company were re-elected at the annual meeting of the stockholders. They are: M. F. Hegge, president; O. J. Sorlie, vice-president; J. G. Oregard, secretary-treasurer; J. H. Tolan, of Mayville, superintendent. Directors: J. G. Odegard, of Northwood; O. J. Sorlie, of Buxton; Jonas Lenz, of Reynolds; Alfred Munter, of Climax; W. S. Christian, of Aneta; P. M. Paulson, of Portland; J. C. Leum, of Mayville; Iver Thompson, of Steele county.

HARTS GROVE, OHIO.—At the fifth annual stockholders' meeting of the Harts Grove Telephone Company, Harts Grove, Ohio, new officers were elected as follows: Eresident, R. Marro, Rome, Ohio; secretary, Dr. F. S. Basquin, Rome, Ohio; treasurer, H. W. Gladding, Rome, Ohio. It was found that the company is in better condition financially than ever before, and new telephones are being added constantly.

UNIONVILLE, OHIO.—The members of the Unionville Telephone Company have elected officers for the ensuing year, as follows: President, J. A. Chambers; vice-president, C. C. Brown; secretary and treasurer, John Gifford. Trustee, three years, Wm. Filkill; trustee, two years, John Gifford.

MISCELLANEOUS.

MINIER, ILL.—Arrangements for the interchange of business have been made between the Minier Mutual Telephone Company and the Hopedale Farmers' Telephone Company.

SHIRLEY, IND.—The Farmers' Mutual Telephone Company of this city and county, has sold its plant and all rights, property and franchises to H. N. Rhorer. The new owner is an experienced telephone man and will improve the plant by installing new equipment and also extending the lines.

COLLINS, IA.—Clyde R. Parks, who has been district manager of the Iowa Telephone Company at Ames, Iowa, the past four years, has purchased W. H. Thompson's interest in the Collins telephone system and will remove here to take charge of his interests about January 1st.

WOODBINE, IA.—Manager H. A. Kinney, of the Woodbine Telephone Company, reports that during the past four months main leads in Woodbine and Dunlap have been put underground. At Dunlap the company is about ready to establish its exchange in a new building, and it expects to construct a concrete fireproof building for its central office in Woodbine next spring.

ATCHISON, KAN.—E. C. Yoakum of Effingham, has bought the Potter Telephone Exchange from A. L. Edminster.

EMPORIA, KAN.—W. W. Finney, manager of the Emporia Telephone Company, has presented a petition to city council asking that permission be granted the company to raise rates provided that company first install a modern plant and furnish the best service possible.

HALE, MO.—The owners of the Hale Telephone Company and the patrons have disagreed over the rates and a stock company has been organized to put in a new system with a capital of $6,000.

ALBANY, N. Y.—J. Harris Loucks, a member of the law firm of Harris & Rudd of this city, has purchased the majority of the stock of the Clarksville Telephone Company which supplies service to 12 villages in Albany county. Mr. Loucks will be president of the new company which will assume control on January 1. A number of changes in the way of improvementts will be introduced.

ALBANY, N. Y.—George B. Wright and Milan Bedrosia, an Armenian, both of Binghamton, N. Y., are to leave shortly for Turkey to investigate the feasibility of installing an extensive telephone system in the Turkish Empire. The two represent Pennsylvania capitalists who have become interested in the project.

SANTA FE, N. M.—The citizens of Logan and vicinity are contemplating organizing a local telephone system.

GRAND FORKS, N. D.—Representatives of the Sheyenne Telephone Company recently met with the directors of the Red River Valley Telephone Company and agreed upon an arrangement for connection at Aneta and Kloten. This will give the patrons much better service.

GRAND FORKS, N. D.—The Parker Telephone exchange with headquarters at Inkster, this county, has been sold to a company of farmers who have recently organized a corporation. The consideration is stated to have been $7,500. Besides the Inkster exchange there are lines to Conway, Medford and Pisek, connection with several other smaller points.

WAHPETON, N. D.—A. H. Burnson has purchased the five rural telephone lines out of Wahpeton. Mr. Burnson will extend the lines so that they will cover considerable more territory and will improve the service in many respects.

RALEIGH, S. C.—The Raleigh Telephone Company, Raleigh, S. C., sent to each of its subscribers an attractively designed and neatly printed folder, expressing the company's good wishes for a happy and prosperous New Year.

The card contains a statement of proposed improvements to be made in the service, and an invitation to call at the office and observe the operation of the system. It undoubtedly will prove to have been valuable from an advertising standpoint.

CHARLESVILLE, TENN.—On Saturday, Jan. 16, at 12 o'clock all the property, franchises and privileges of the Charlesville Home Telephone Company will be sold at auction. This sale will be conducted by Ernest B. Denison, formerly general manager, and now receiver of the property, who has been appointed Special Master to sell the property under a foreclosure decree. No bid less than $50,000 will be accepted, and bidders must qualify by a deposit, in advance, of $2,500 or $7,500 par value of bonds of the company. The successful bidder is required to deposit $5,000 at the time of sale.

SINTON, TEX.—J. B. Dodson has purchased the local telephone system of Sinton from J. J. Greathouse, of Berclair, Tex. Mr. Dodson will make many improvements in the service.

LOVELL, WYO.—A committee has been appointed to arrange for the consolidation of the telephone systems of Lovell, Byron and Crowley.

NEWCASTLE, WYO.—The Inyan Kara Telephone Company has purchased from Peter Kinney the Independent telephone line connecting Newcastle and Sundance.

WINNIPEG, MANITOBA, CAN.—An important announcement will be made by the Manitoba government shortly dealing with a reduction in the telephone rates. The domestic rates will be cut from $30 to $20, while business telephones will cost from $30 to $35 instead of $50. It is said that the provincial government will have a surplus of $225,000 on the construction of the telephone services for this year. Many new lines will be constructed during the coming year and these are all expected to pay good returns.

UNDERGROUND.

DENVER, COLO.—The Colorado Telephone Company will place a large part of its wires underground during the coming year.